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October
1933

Electrical Contracting

With Which Is Consolidated
Electrical Record

33rd Annual Convention

National Electrical Contractors Association

held this year at the request of the
executive committee of the Asso-
ciation in the pages of this magazine.

Address of President, Reports of Committees,
Addresses

PAGES 6 to 15

Read the first installment

Explosion-Proof Wiring

..... page 16



Fuses . . Like Block Signals . . Must Be Right

FUSES, like block signals, must function. Failure invites disaster, for equipment, if not for life in every case. It does not pay to take any chances.

What is its past record? How careful is its maker? These are vital questions to ask when selecting an essentially simple, little device like a fuse. For over 40 years, Jefferson (Union) Fuses have been giving the unfaltering, accurate protection you expect—*proven protection*.

Jefferson (Union) Fuses are used exclusively by many leading plants because they are so ruggedly built, accurate, and quick to renew.

Jefferson Electric Company
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Jefferson knife-blade type. Simple—only three units. Rugged—withstands repeated blowouts. Saves time—only one loose end-cap, studs need not be removed—only loosened.

JEFFERSON UNION RENEWABLE FUSES



VOLUME 32
NUMBER 12

electrical contracting

WITH WHICH IS CONSOLIDATED ELECTRICAL RECORD
S. B. WILLIAMS, EDITOR AND GENERAL MANAGER

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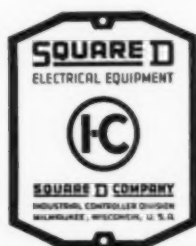
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ADVERTISING

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MEMBER AUDIT BUREAU OF CIRCULATIONS AND NATIONAL PUBLISHERS' ASSOCIATION. ALSO PUBLISHERS OF ELECTRICAL WHOLESALING AND MILL SUPPLIES.

MOTOR CONTROL *for* HAZARDOUS LOCATIONS



DID you read Mr. C. W. Gustafson's article on Hazardous Location Wiring in this issue of Electrical Contracting? Square D has definite suggestions for protecting Electric Motor Control.

Where electrical equipment is used around vapor air mixtures of Duco, lacquers and thinners, alcohol, acetone, gasoline and other petroleum products, it's safe to use control apparatus which has Underwriters' approval.

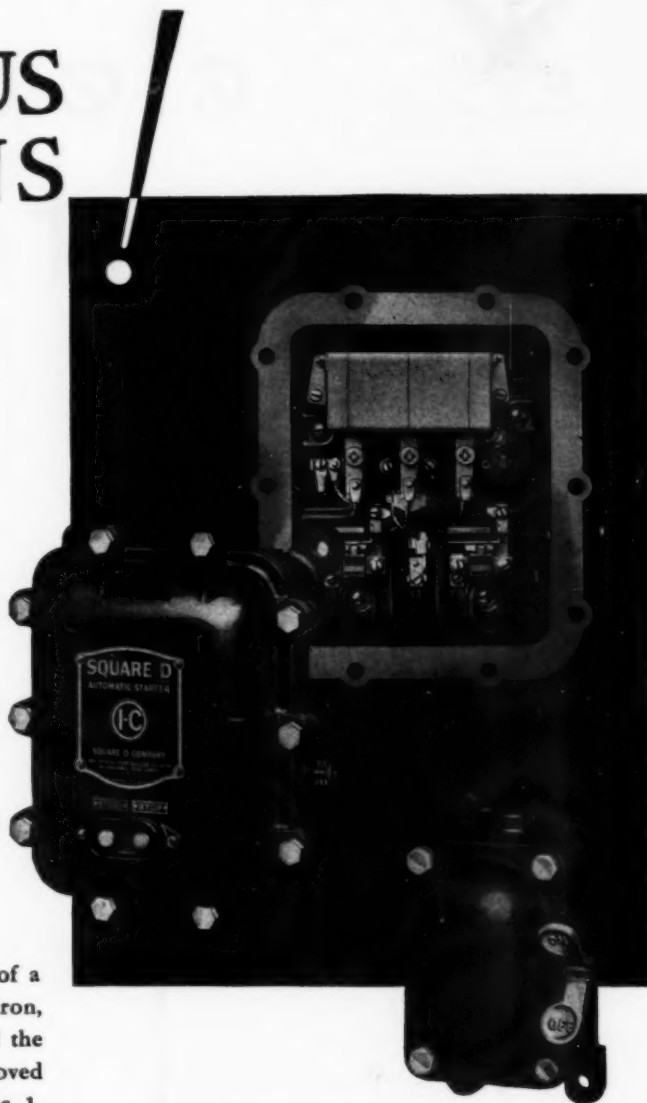
Illustrated are open and enclosed views of a typical A. C. Automatic Starter with cast iron, explosion-proof enclosure. This Starter and the remote control push-button station are approved by the Underwriters' Laboratories for Class 1, Group D Hazardous Locations.

The Industrial Controller Division of the Square D Company at Milwaukee manufactures all types of electric motor control—explosion-proof, dust-tight and water-tight. Control engineers at the Square D district offices will gladly help you with special control problems.



SQUARE D COMPANY

INDUSTRIAL CONTROLLER DIVISION
MILWAUKEE, WISCONSIN, U. S. A.



TODAY PRESENTS **NEW** OPPORTUNITIES FOR CONTRACTORS

Today industrial activity is going rapidly forward.

With industrial wheels turning again there is the need for maintenance and replacements and additions to the electrical equipment.

Few plants have full maintenance crews, many have none. They are looking to the electrical contractor.

Here lies a profitable field and immediate opportunity for the alert electrical contractor. Offer these revived industrial plants a complete electrical maintenance service. And remember, complete and modern service must include Automatic Motor Control.

BRANCH SALES OFFICES IN ALL PRINCIPAL CITIES

Capital Goods

WHEN industries first began to draft NRA codes it was not unusual to find paragraphs preventing members from increasing plant or machine facilities in the mistaken notion that such action had to be taken to develop employment.

It is now apparent that had such thinking been allowed to gain headway the result would have been very disastrous for the country as a whole.

IF one will look back over previous financial and industrial depressions he would find that the real depression was not so much in consumption commodities as it was in capital goods.

A people has to live even during a depression and therefore there can be no serious stoppage of the flow of consumption commodities, such as food and clothing. There is, of course, a lessened consumption but upon analysis it will be found that this is due largely to unemployment in the capital goods industries.

People can exist without new machinery and construction projects with the result that a depression almost entirely closes up the capital goods industries thereby causing a great part of the unemployment.

No depression can be said to be safely past until the labor in these industries has been reemployed.

IT is wealth creating activity that always causes a return to prosperity. Production of consumption goods is not wealth creating because it does not create something that is enduring or which in turn creates more production of some other commodity.

Thus it will be remembered that the big depression following the Civil War was overcome through the expansion of railroad facilities.

The 1921 depression was quickly stopped by the big building boom.

And so at this time we can hope for no lasting relief until we begin once more to create wealth

either through new construction or through the re-vamping of our factories with modern machinery and equipment or both.

TO the electrical industry this is most significant because this industry grew as a capital goods industry. It was only when it began to rely on the consumption market that it began to have troubles.

So long as new lines were being developed, old houses and other buildings were being wired there was growth for the industry.

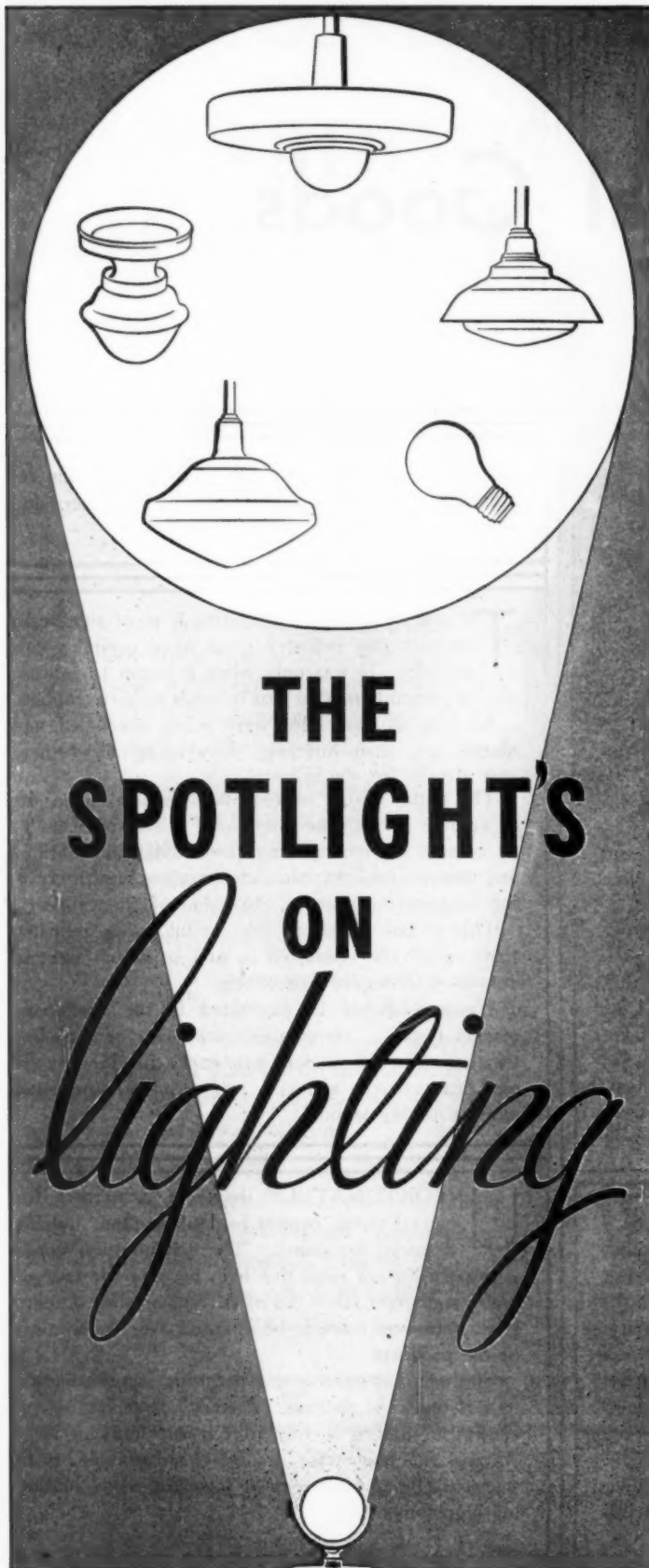
The initial wiring of old buildings is past so far as volume is concerned but there is still business to be created by modernizing these older installations and through reinspection. Such work is wealth creating because it improves the value of the property.

This is one phase of the capital goods industry that we all are interested in and in which we can ourselves accomplish something.

We also should be interested in the machinery market because this creates work also for the electrical people. All modern machinery for factories is electrically driven and as a rule requires a new and modern wiring layout.

UNFORTUNATELY, however, a market for capital goods cannot be built without outside financial assistance. The consumption goods industries do not need this help because the cost of their products is taken out of current income. Capital goods, however, have to be financed over the lifetime of the products.

The national government is giving some attention to this phase of national recovery. When it is successful in finding a way to release funds in large volume for long term credits or reasonable terms there will be no further need for artificially stimulating employment.



...Take advantage of the Industry's Lighting Drive

Power and Light Companies, Electrical Manufacturers, Dealers, Distributors are concentrating on **LIGHTING** this fall. Intensive sales efforts and advertising under the slogan "Better Light, Better Sight" will take place throughout September and October.

The Electrical Contractor will be among the first to benefit. Every Lighting installation means a job for him. To alert Contractors, Lighting installations may be opening wedges to other profitable electrical work in the same building.

Do your part. *Sell Lighting . . . Sell "Better Light, Better Sight."*

When you do, you'll find in Graybar a logical source of fixtures and glassware for *any* Lighting need—Industrial, Commercial, Store, or Home.

You'll find Graybar equipment backed by a 64-year reputation for *quality* . . . Put that reputation behind your own business reputation, particularly at a time when *quality* is becoming an increasingly important sales factor.

Write for the new Graybar Lighting Catalog or ask your Graybar Salesman for a copy.

GraybaR

ELECTRIC COMPANY

OFFICES IN 73 PRINCIPAL CITIES. EXECUTIVE OFFICES: GRAYBAR BLDG., NEW YORK

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OCTOBER
1933

the fable of the long spoons

BY JOHN WISE



Once there was a large industry, suffering from malnutrition, and, after a few years of conditions with which we are all disgustingly familiar, it was hard to tell which was the more emaciated, the industry or its executives.

Now, industries do not die, but executives do. So we find ourselves in Heaven, reporting the experience of an executive in that industry, who had shuffled off. He was thinner than a midnight ghost, but when he was shown to the quarters of his industry and saw some of his former associates, he noted with alarm that they calipered several hundredths of an inch slimmer than he.

This was the more remarkable because his friends had just emerged from their quarters after a luncheon where a most appetizing stew was being served. Puzzled, but

with his nose twitching at the delicious aroma, the executive hastened to the dining room, where he learned the reason for his friends' starving condition.

He was horrified to see that every man had a spoon strapped to each of his arms. The spoons were so long and were attached in such a manner, that, although the unfortunate diners could dip into the stew, they could not raise the spoons to their mouths. As he stared aghast, a vigilant angel swiftly provided him with a similar outfit.

"Aw-waw! Aw-waw!" the executive raised a fearful wail and went dashing to find St. Peter. They couldn't treat him and his friends that way, he'd see about this, etc. But as he hurried up Golden Gate Boulevard, he saw some

executives from another industry coming from lunch, all picking their teeth and with tummies like balloons.

"How come?" he screeched, "Why this favoritism? How do you guys rate a swell feed while we starve? How—"but they stifled his cries and led him

gently into their dining room, where other members of their industry were still at lunch. He was astonished to note that the men in this supposedly favored group also had a long spoon attached to each arm.

BUT—they were pouring in the stew and enjoying it immensely. For, instead of wasting their time and energy devising ways and means to feed themselves, every one of them was busily engaged in feeding another, and, in turn, being fed by that other.

This lesson is of course good anywhere, any time, but especially now. We must avoid the dangers of a selfish scramble. When the starving pack begged the Lone Wolf, whom they had foolishly deposed, to lead them again to plenty, he said: "Nay, when ye are full fed once more, the madness will come upon ye again, that ye rend one another quarreling over the kill."

A period of bustle and expansion is ahead, bringing new conditions and demands on character. And the most important requirement is that each must subscribe to a program of co-operation and fair play toward his fellow-contractors.

Live and let-live is good business, not altruism.

Our NRA Code

By L. E. MAYER

President, National Electrical Contractors Association,
and Chairman of the N.E.C.A. Code Committee

SINCE our thirty-second annual convention last October, the mind of the American people has been lifted from despair to hope. Helpless resignation to depressing conditions over which men seemed to have no control has been supplanted by eager anticipation of times filled more than ever with the joy of living because men have awakened to the fact that they can control their own destinies. The National Recovery Administration has begun to lead workers, employers and consumers out of the depression and towards a new prosperity. "Trade," says General Johnson, "has a new charter of opportunity and freedom."

To the electrical contracting industry, as to all industry, the NRA opens the door to that wider opportunity for service and profit which reflects freedom controlled in the interests of all, rather than license left unrestrained that the few may benefit over the many.

If we take full advantage of the guidance, protection and power offered by the NRA, we shall win our full share of the new prosperity. More important, we shall keep step with a people who are confident that the future towards which they have begun to march holds greater prospects than any period in the past has bestowed.

A speaker at our last convention said: "We know very definitely that where we are going is where profit lies. It is impossible to travel any other route than well-planned action that will develop open competition for the greatest number of us, and that unison of action, cooperation, consolidation of thought and effort are the ruling factors".

The year that has passed since those words were addressed to our convention has seen no more significant development than the birth of NRA Codes of Fair Competition. These codes are designed to foster, and even to compel within an industry, unity of action, cooperation and consolidation of thought and effort to the common and all-essential ends of self-preservation. President Roosevelt has said that the NRA assures each industry "the right to act in unison".



L. E. MAYER
Chicago, Ill.

What we have been unable to do towards ejecting unfair competition from our own house the NRA, through the electrical contracting industry's code, is preparing to correct.

When signed by President Roosevelt that code will become the business law of the land for non-members as well as members of the National Electrical Contractors Association. That will mean unity of thought and action. It will mean power backed by Federal law to overcome the evils that beset us from within.

Our code will give us a powerful weapon against bid peddling. A provision designed to kill this vicious practice is contained in the basic code for the whole construction industry. Such a provision is incorporated in every code affecting the branches of the construction industry, including our own. Thus we shall be able to fight bid peddling more effectively

than ever before, because the evil practice will be banned throughout the construction industry.

Under our code we can consolidate our thought and efforts upon sound business methods that will spell self-preservation and rehabilitation towards better progress for ourselves individually and as an industry.

The difficulties of phrasing a complete set of business principles for an industry in terms acceptable to everybody are numerous. The electrical contractors' committee has labored day and night to design a code. Interests of non-members as well as members of our association have been kept in mind.

Every contractor should study the code with an open mind and adapt his business whole-heartedly to its provisions when approved.

Enforcement of our code demands as widely a united front as it is possible to muster among the 15,000 or more contractors in this country. The trade association is the spearhead of the nation's charge through the forces of depression to the objective of prosperity. That favored position has already enlarged N.E.C.A. membership.

Rapid and substantial membership growth reflects recognition by electrical contractors of the possibilities

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opened to their business by the NRA. It also reflects their conviction that the N.E.C.A. has proved itself thoroughly competent to represent their best interests in administering as well as in formulating their code.

Our membership must continue to grow. Recognized by the NRA as official spokesman for all electrical contractors, our association deserves the support of every contractor. And there is no contractor who does not need the power and protection that membership in the N.E.C.A. gives him.

By joining the N.E.C.A. the contractor can protect and advance his welfare with a punch far more powerful than he could swing alone. Only through strong local associations whose members belong to the national association can our outposts in the fight for a new prosperity gain enough power to win.

We know the high value of the association's services

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to us in the past. We know that its services, enlarged under the code, will be more valuable. Let each of us take advantage of this unsurpassed opportunity to impress the value of those services upon all non-members.

There are indications that we shall be faced with code enforcement problems. That is one of the strongest reasons why a large membership and an alert leadership in the N.E.C.A. are essential. Since the association is recognized by the NRA as official spokesman for all electrical contractors, it must be equipped and at all times prepared to make its voice heard with maximum effect.

Through one national association contractors can work towards setting up all-industry trade promotional machinery which is necessary for the enforcement of our code.

Report of Trade Policy Committee

J. A. FOWLER
Chairman

YES, we have no ethics. Out of the maze of charge and countercharge—denials and confessions, the spectators at the industries' code hearings in Washington have had confirmed the long standing impression that American business has not aspired to a very high standard of decency in its competitive relations.

Using the subterfuge that "competition is the life of trade" a relentless industrial warfare has to its shame countless victims, who have been sacrificed to the practices of those who subscribe to the theory that only the strong shall live.

Governmental recognition of the need for a code of fair competition is an event of supreme importance to every business and justifies the long struggle of every Association Trade Policy Committee, many of whom have labored for years to correct internal and external trade practice abuses.

We have been extended a Magna Carta for industry—an equality of commercial opportunity—but unmistakable evidences of selfishness and greed have clouded the issues and have tried the patience of patriotic men in every avocation.

The N. E. C. A. has tried for years to secure a recognition of and a respect for the natural rights of all branches in the electrical industry. We believe that generally the function of each is obvious. Any practice that throttles a competitor or injures a commercial dependent outrages the principles of industry relationship and should be an unfair trade practice.

The manufacturer's recognized approach to the consumer, with certain well known exceptions, is through the wholesaler and the retailer or contractor. This method of distribution is economically sound and under normal conditions is respected as such, but four years of famine have undermined the good intention of many who otherwise would remain steadfast.

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The National Recovery Act should have, and in the minds of its originators did have, for its purpose not alone the recovery of business but the recovery of those fundamentals in business relationships without which our commercial structure cannot withstand the assaults of another depression.

In the Code of Fair Competition for the Electrical Contracting Industry there is submitted a reciprocal proposal or recognition as to the interdependence of the contractor-dealer and the electrical wholesaler wherein the obligations of these two branches are clearly outlined. If this friendly gesture is met in like spirit by the wholesalers and is accepted as a part of the respective codes a long step toward industry harmony will have been taken.

Following the submission of our code protests were made by certain interests among electrical manufacturers and utilities who objected to the application of



J. A. Fowler
Memphis, Tenn.

our code to them when they engaged in activities covered therein. We are confirmed in the belief that it is the intent of NRA to apply the same contractor-dealer yardstick to a manufacturer, utility or wholesaler when our field is invaded by them, just as the yardstick of the manufacturer or wholesaler should be applied to the contractor or dealer, of whom there are some, who ven-

tures into the manufacturing or wholesaling field.

Practically every effort the N. E. C. A. has made to bring about fair methods of distribution, co-operation looking toward credit control, etc., has been evaded by other branches as illegal on advice of counsel. NRA has confounded these lawyers of evasion and puts it up to industry to wash out such problems.

The Way to Make Contracts Equitable

By G. M. Sanborn

Chairman, Committee on Architects and Standard Symbols

PROPOSED amendment to Article V, Section 20 of the Code of Fair Competition for the Electrical Contracting Industry reads:

"The Standard Form of Contract Documents of the American Institute of Architects is recommended to be the basis used for all contracts."

I think that in making contracts it is to the distinct advantage of our members to insist upon the use of these documents.

The documents consist of:

General Conditions of the Contract.

Standard Form of Agreement for the Construction of Buildings.

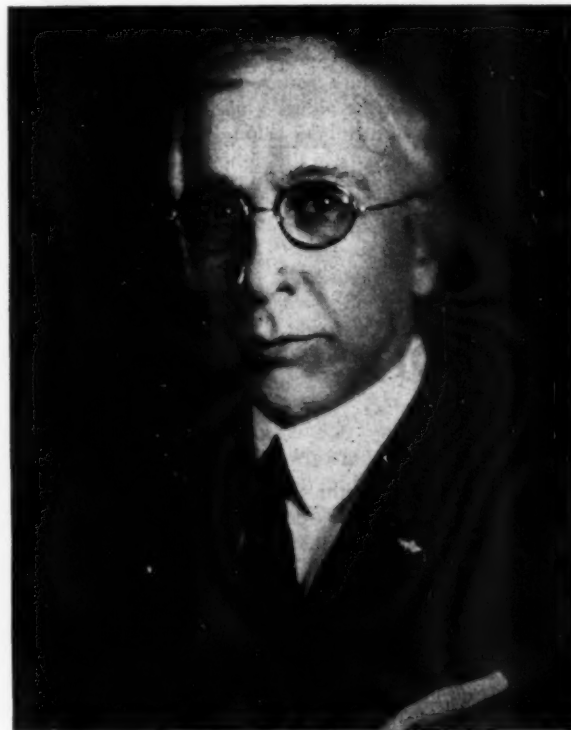
Standard Form of Subcontract.

Standard Form of Acceptance of Subcontractor's Proposal.

Standard Form of Bond.

The N. E. C. A. has approved these documents. In whole or in part they have also been approved by the National Association of Builders' Exchanges, the National Association of Master Plumbers, the National Association of Sheet Metal Contractors of the United States, the National Association of Marble Dealers, the Building Granite Quarries Association, the Building Trades Employers' Association of the City of New York and the Producers Council. The Form of Agreement and the General Conditions of the Contract have been approved by the Associated General Contractors of America and the Joint Conference on Construction Contracts.

Under these documents contract relations among the parties concerned in building construction jobs work out satisfactorily. I do not know of any cases where settlement of controversial points has not been amicably arranged under these documents. They express complete understanding of the contracting business in general,



G. M. Sanborn
Indianapolis, Ind.

and of the subcontractor's as well as the general contractor's requirements with respect to agreements to perform work and to be paid for it under equitable conditions. The documents cover fully all contractual rights of all parties, protect each party's best interests, and provide an equitable method of settling differences. Out of their broad experience those who prepared the documents have provided for practically every contingency.

Too frequently when a contract is about to be entered into the builder presents for signature his particular form of contract, drawn for the sole purpose of protecting him, and therefore not equitable to all parties. The owner usually calls in his lawyer who, not being familiar with all the ramifications of the contracting business and hence without knowledge sufficient to prepare an equitable agreement, undertakes to draw up a contract in the interests of his client.

It would seem that no general contractor or owner who is willing to make equitable contracts could find any logical reason for objecting to the use of these documents.

Use of the standard forms supplemented by additional articles as required to fit conditions of a special opera-

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tion or individual practice is better than use of private forms closely patterned on the standard forms. •

Although the forms are suited for use in connection with a single or general contract, they are equally applicable to the various parts of an operation conducted under separate contracts.

The Standard Form of Agreement Between Contractor and Owner covers scope of the work, time of completion, contract sum, progress payments, acceptance and final payment. Together with the General Conditions of the Contract, the specifications and drawings, this agreement forms the contract.

Proposed revision of Article 40, Arbitration, has been approved by the N. E. C. A., the Associate General Contractors of America and the National Association of Builders Exchanges. This revision is awaiting final approval by the American Institute of Architects.

The revision provides for arbitrating all disputes in accordance with the Standard Form of Arbitration Pro-

cedure of the A. I. A. Except by agreement with the owner the contractor shall not delay work during arbitration. Notice of the demand for arbitration must be filed in writing with the architect and owner within a reasonable time, or if it is an appeal from the architect's decision, within ten days of its receipt. No demand can be made after final payment except as otherwise stipulated in the contract.

The arbitrators may award to the party whose contention is sustained such sums as they deem proper to compensate him for the time and expense of arbitration. If the arbitration was demanded without reasonable cause, the arbitrator may also award damages for delay. The arbitrators shall fix their own compensation, unless otherwise provided in the agreement, and assess costs and charges of the proceeding upon either or both parties.

The Standard Documents are for sale by the American Institute of Architects, Washington, D. C., and by stationery dealers in all large cities.

Industrial Contractors Demand Fair Competition

By H. B. Frazer

Chairman, Industrial Development Committee

If contractors doing industrial work expect to continue in the electrical business they must do a better selling job for themselves so that they can justify their insistence on proper protection of their interests by the manufacturer and the wholesaler.

These two essentials go hand in hand. Our selling job is seriously handicapped wherever the manufacturer or wholesaler denies us proper protection by competing against us for industrial plant business. But perhaps we are not in the strongest position to insist on protection from such competition unless we have proved to the full our ability to handle all of the industrial plant's electrical requirements more efficiently than any manufacturer, wholesaler or maintenance department.

Between this competition from wholesalers and the charge that many contractors are poor credit risks there is an obvious connection. That industrial plant contractors are poor credit risks may be true to a certain extent, but it is not their fault. In most cases the wholesaler, if he will look through his records, will find that the contractors whom he calls poor credit risks have paid 75 cents on the dollar. Why has the contractor been unable to pay the other 25 cents? Because the wholesaler is the chief competitor of the contractor in industrial plants.

If the necessary protection had been given to the contractor by the wholesaler, there would have been little or no loss to the wholesaler. In all such cases the contractor, if he is to get the work, must sell his materials to the plant at the same price the wholesaler does. This

is an unhealthy condition. On this kind of business no contractor can exist. This inequitable condition is the reason why the contractor has been unable to pay the 25 cents he has been short.

We deserve protection from the wholesaler in another important respect. Too often wholesalers recommend to our prospective customers that they hire their own plant electricians to do a certain job at a wage considerably below what we must pay. The wholesaler tells our customer that he needs, for all his electrical work, only the services of his plant electrician plus the assistance of any other help that may happen to be handy. This, so the wholesaler's argument runs, will eliminate paying a profit to the contractor.

This sort of underselling on the part of wholesalers, this chiseling of our legitimate customers away from us, is what I would call an unfair trade practice. It must stop if industrial electrical contractors are to continue to exist.

I am aware that the code first proposed by the wholesalers defined a wholesaler as one who sells, among others, "to industrial companies which have electrical maintenance departments." But the same code draft also defined the wholesaler as one who sells "to dealers for resale." With reference to the materials used in industrial plant installation and maintenance, who, properly, is the retailer? Is he not the electrical contractor who engages in such business?

So-called wholesalers who are guilty of the practice against which we must protest are not, to that extent,



wholesalers at all. If they were, they would sell to the contractors who in such cases are the retailers buying for resale to the industrial plant. Wholesalers should stop stepping over into our field by trying to convince plant owners that their electricians or maintenance men are as well fitted to do all plant work as the contractor who knows how to maintain equipment at minimum trouble expense, and also how to engineer an installation, extension or alteration so that, by allowing properly for the future, it will entail minimum expense for changes to meet expanding demands.

We must also protest against the practice of manufacturers in selling direct to industrial plants that are our legitimate customers. If we do not see that the wholesaler gives us proper protection, we shall have to insist that the manufacturer gives us the same protection he gives the wholesaler. The manufacturer who sells to our customers at the price we pay the wholesaler should be shown the justice of our receiving the same differentials as the wholesaler receives.

But let us look at this whole question frankly. Perhaps we have a problem to solve among ourselves before we can demand all the cooperation we need from manufacturers and wholesalers.

If we expect to get anywhere we must see that the manufacturers and wholesalers discontinue their present practices. But in order to accomplish this we must show them that we will take care of all demands made by industrial plants in which we are interested.

We must go out and work among the industrial plants and become familiar with their requirements and with the new apparatus that is being manufactured today. It is up to us to show the electrical industry that we are

able to do a good engineering and selling job. We have been asking for protection for a long time, but perhaps in all cases we have not proved to manufacturers and wholesalers that, from their own standpoints, we are entitled to it.

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The complaint the manufacturers seem to have against us is that we are not able to do an engineering job, and so they feel that they must take all equipment over 200 hp. But since in most cases we are familiar with the plant's problems, we should be in a better position than anyone else to tell the owner his electrical requirements.

In the past a good many contractors have asked manufacturers what size motors would be required to certain equipment. If we are not familiar with the

horsepower required for these machines, we should be able to make the necessary tests as accurately and competently as any electrical manufacturer. If he is up against a new problem, he goes out and buys the brains necessary to solve it. We contractors must be in the same position if we expect protection on equipment over 200 hp. and on synchronous motors and controlling apparatus.

Today the government is asking us all to do business under codes of fair competition. There should be no trouble in proving to industrial plants that we are in a better position to take care of their electrical requirements than any manufacturer, wholesaler or maintenance department. That is the job that faces the industrial contractor. It must be done if we expect to continue in the electrical industry.



H. B. Frazer
Philadelphia, Pa.

Bid Peddling Outlawed

By L. W. Davis

General Manager, N. E. C. A.

STANDING at the head of the list of the many constructive provisions in the codes of fair competition which have been coordinated through the Construction League of the United States, the section in the master code for the construction industry outlawing bid peddling will correct more far-reaching abuses and bring greater benefit to all industry groups and to the public than all other proposed measures.

Bid peddling has been beyond the power of any single group, or even several groups together, to abolish. An industry-wide racket, fixing its claws and its destructive levies on every group and every individual within the industry, bid peddling could only be smashed by arousing the whole industry to united action.

That action has been taken in Section 10 of the master code of the Construction Industry, which will govern alike the architect, engineer, general contractor, sub-contractor and supplier of materials for every construction project. In its opening sentence "the practice of 'bid-peddling' by any person . . . is prohibited". It defines bid peddling as "furnishing to any bidder or other person, either directly or indirectly, at any time prior to the publication of the bids, any information, statement or intimation relative to his own bid, to the bids of others, or to the awarding authority's own estimate". (Penalty for violation, under the N.I.R.A., \$500 for each offense, or six months in jail.)

By a single stroke this action of the construction indus-

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Bidding Rules in Master Code for Construction Industry

Sec. 10. Bid Peddling Prohibited—The practice of "Bid Peddling" by any person as defined in Section 1 of this Code is an unfair trade practice and is prohibited by this Code. Furnishing to any bidder or other person, either directly or indirectly at any time prior to the publication of the bids, any information, statement or intimation relative to his own bid, to the bids of others, or to the awarding authority's own estimate is prohibited.

Bidding Practices—The following bases of contractual agreements are recognized as fair trade practices; guaranteed price, cost of work plus a fee, unit price, lump sum, and other contractual methods not inimical to the public interest, providing that the regulations contained in this Code of Fair Competition are met.

It is recognized that the preparation of a bid is a service involving an expense to the bidder, therefore, inviting and receiving of an unreasonable number of bids results in an economic waste. It is recommended that invitations to bid should not exceed six (6) in number.

Wherever the designation "awarding authority" is employed, this refers to architects, engineers, contractors, subcontractors, or other persons who may award contracts or purchase materials for construction purposes and these, therefore, are to carry out all the requirements enumerated below.

(a) Prequalification of competency of bidders to perform the work involved is imperative. No contractor, sub-contractor, furnisher of material or equipment, as the case may be, shall be permitted to bid unless he has demonstrated to the awarding authority that he is competent technically and financially to perform the work. A contract bond, when required, shall not be held to reinforce or enhance a bidder's credit, stability or capacity, but shall be considered only as protection against business accidents.

(b) There shall be no collusion between the awarding authority and the seller, nor between the different sellers in the preparation of any bids, nor shall the awarding authority use any bid which he has reason to believe is at or below cost; but

where this question arises, the purchaser must give the seller the opportunity of demonstrating by cost sheets or other methods, the correctness of the bid that he has submitted, if he desires its consideration. Collusion in any form is to be considered an unfair practice under this Code and is prohibited.

(c) An awarding authority inviting bids shall make available complete plans and/or specifications and other pertinent information in order that the bidder may prepare a complete estimate or bid in accordance therewith.

(d) An awarding authority shall designate a specific hour and place for receiving and opening of bids. All bids shall be sealed and signed by the bidder or his duly authorized agent. Bids received after the opening of bids shall be returned unopened. Bids received by the awarding authority from uninvited bidders shall be returned unopened.

(e) Supplemental codes shall require that the code authority for each trade shall provide a depository for duplicate bids, and shall require that all bidders file sealed copies of their bids, and any revisions thereof, with such designated depository.

All sub-bids should be delivered to contractor 24 hours prior to the delivery of bids to the awarding authority; copies of all such sub-bids shall be delivered at the same time to the various sub-contractor depositories. They shall be opened and made available to the bidders at the same hour as the opening of the lump sum proposals by the awarding authority.

(f) The awarding authority shall make an award or reject all bids, or obtain an extension of time from the bidders, within twenty (20) days after the opening of bids and shall make such award to a bidder, at his original bid price, who has complied with these rules.

The right to reject all bids is reserved to the awarding authority. Where all bids are rejected, bids shall not be again invited or submitted previous to the elapse of ninety (90) days from the date of such rejection, except there be a substantial change in the plans and/or specifications

amounting to at least ten per cent of the previously estimated cost of the work; or, except that there shall be such a marked variation in the bids submitted from the awarding authority's estimate as to the valuation of the work as would indicate to the owner the necessity of new bids in order to secure fair competition. In such contingency the awarding authority, with the consent of the owner, may secure new bids for such work.

(g) The awarding authority in issuing his invitation to contractors on lump sum proposal, will require the list of subcontractors whom the contractor intends to employ for every division of the work to be submitted with his bid. If, however, the awarding authority does not approve any particular subcontractor submitted by the contractor, he may reject that bid, but he shall use the bid of some other subcontractor who has already bid on the work, and the contractor's bid may be increased or decreased in the amount between the bid used and the one rejected. If a contractor uses in his proposal the bid of any subcontractor for any division of the work; in the event that he is awarded the contract, and if he receives the approval of the awarding authority, he is to award the contract for this particular subdivision to said subcontractor without further bids for the class of work to be done. Where the contractor contemplates doing the work of any particular sub-division with his own forces, and is qualified to do so, he will so state in his proposal.

(h) Where a contract is to be executed on other than a competitive basis; such as, cost plus a fee, the owner or his representative shall have the right to approve the list of sub-contractors to be invited to bid, and to approve the sub-contractors to whom the work is to be awarded.

(i) Every rebate, refund, allowance, discount, commission, or service privilege in whatever form shall be extended by vendor to every purchaser under like terms and conditions.

All supplemental codes shall provide for the enforcement of the provisions of this section 10.

try moves to place competitive bidding on a fair and honest basis. The bidder's first bid is protected and final, and will no longer be merely a camouflage, a disguise under which the real trading for preferred place has been concealed.

Prequalification of competency of bidders to perform the work involved is made imperative, and no contractor, sub-contractor or furnisher of materials shall be permitted to bid unless he has demonstrated that he is competent technically and financially to perform the work. A contract bond shall not be held to reinforce or enhance a bidder's credit, stability or capacity, but shall be considered only protection against business accidents. Bonding companies are proposing to support this provision by also requiring prequalification before issuing a bond.

Collusion in any form, between the purchaser and the seller, or between sellers, is prohibited. The awarding authority is prohibited from using any bid which he has reason to believe is at or below cost. He shall designate

a specific hour and place for receiving and opening of bids, and any bids received after the opening, or received from uninvited bidders, shall be returned unopened.

Supplemental codes for each trade shall require provision for a depository for duplicate bids and require that all bidders file sealed copies of their bids, which shall be opened and made available to the bidders at the same hour as the opening of the original bids. The awarding authority shall make an award or reject all bids . . . and shall make such award to a bidder, at his original price, who has complied with these rules.

The general contractor shall be required to submit with his bid a list of the sub-contractors whom he intends to employ for every division of the work; but if the awarding authority does not approve of any particular sub-contractor he may reject that bid, but shall use the bid of some other sub-contractor who has already bid on the work, using that sub-contractor's own bid. If a contractor uses

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Fair, Uniform Credit Terms

By Louis Kalischer

Chairman, Committee on Credits and Accounting

ALL of the codes under the NRA are based upon the fundamental principles of fair competition. With that clearly in mind, it ought to be easy for any industry, having full knowledge and complete data of its particular class of business, to set up a code that will approximately bring about this result.

It must be obvious that no code or plan can be 100 per cent perfect. It is only when attempts are made to cover every possible, even unusual situation that the writing of the code becomes involved and its meaning somewhat ambiguous, and in many cases permits of decisions that call for further interpretations.

Article VI (a) of the proposed electrical wholesalers' code reads:

Wholesalers shall not give a discount for cash greater than the percentage of discount offered by the manufacturer of the products invoiced, and no discount shall be allowed on accounts remaining unpaid after the 10th of the month following the date of shipment. Terms for net sales should not exceed 30 days from the day of shipment.

The discount offered by the wholesaler should be uniform, irrespective of the discount offered by the manufacturer.

First, the manufacturers may or may not offer a uniform discount, and therefore the discounts on the present basis are varied. The wholesalers, surely, are a recognized business, and they should provide a discount to apply to their branch of the business.

This discount should provide for an incentive and an inducement on the part of the buyers of the wholesalers' goods to pay their bills promptly.

If the differential between a prompt payment and a delayed payment is very small, certainly there will be no incentive to make prompt payments. And again, by the same token, a small differential places the buyer who is unable to pay promptly on an equal footing—no penalty—with the buyer who secures the funds through his bank or from his own resources.

In preparing his estimates this may seem like discrimination, and in effect it is, because the buyer depending upon his payments for work may have under-estimated or extended credit to his customer or buyer that is unusual and perhaps unsound, and his failure to receive payment makes it impossible for him to pay the account. Therefore this loss in turn must be absorbed by that particular branch of the industry.

Further, the small differential places this buyer in a position to take unusual gambles due to his being placed on a parity with the buyer who does pay his account promptly, because he has the financial resources or the



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banking facilities to do so. This is an entirely different situation—gambling by low bidding to secure work with the other fellow's money rather than your own.

What is needed, then, is a discount large enough to make it an inducement to pay promptly, and also to hamper, or I might even say restrict this class of unfair competition.

Certainly, it is not unfair to protect the buyer who pays from the buyer who will pay only if he guesses right. Therefore, a discount of at least 5 per cent should be established for prompt payment of bills. This should be stated definitely and clearly.

The statement that "terms for net sales *should* not exceed 30 days" ought to be change to "*shall* not exceed 30 days."

It is apparent that "terms for net sales *should* not exceed 30 days" does not by any means assure credit conditions that would be of any real benefit to the industry. Use of the word "*should*" instead of "*shall*" would leave the situation wide open. The contractor who paid within 30 days would be at a disadvantage compared to the contractor who did not.

It might even seem fair to assume that the wholesaler who allowed any account to run beyond the 30 days, and who continued to sell to that account during its delinquency, would be guilty of violating, at least in effect, the following provision in the proposed wholesalers' code:

Article X, Unfair Trade Practices. Section 5, Secret Rebates. The secret payment or allowance of rebates, refunds, commissions, or unearned discounts, whether in the form of money or otherwise, or secretly extending to certain purchasers special privileges not extended to all purchasers under like terms and conditions.

Perhaps the situation might be covered effectively by some such provision as the following:

The terms of sale shall be uniform to all purchasers. Therefore terms for net sales shall not exceed a definite period (30 days)

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or what-not), and the account which is delinquent beyond that period shall not be sold by the wholesaler on the same terms as the account which meets its obligations under this section.

The above arguments also apply to Article VI, Section (c) of the proposed wholesalers' code, which reads:

No cash discount shall be allowed where payment of an invoice is made by warrant, note or trade acceptance, or where there is an unpaid balance due, unless such balance is due to and confined to items in dispute.

Where the discount is very low, it must be apparent that unusual credits will be extended by the use of notes or trade acceptances. This can very readily be used to extend long-time credits without the same positive assurance of payment and, as the paragraph is written at present, to remove the incentive for cash payment.

To repeat, a code of fair competition ought not to be difficult to write if that is the end sought and if it is approached from that angle only.

The Motor Specialist and the Code

By F. O. Sievers

National Executive Committee
Chairman, Motor Distribution Committee

HOW can the motor specialist or motor repair shop benefit under an electrical contractor's code? This is a fair question that has come to the minds of perhaps hundreds of men engaged in this phase of the business, and particularly so at this time because, as in the contracting branch, price slashing, bid peddling and other unfair methods of competition have gradually undermined the business.

In the hope of stabilizing rewinding prices, rental rates, service and maintenance rates and prices of reconditioned equipment, our code committee has inserted Article V, Section 18.

The electrical manufacturers have a similar section in their code, presumably for the purpose of price stabilization, and if it meets their conditions it should likewise meet ours, insofar as this particular branch of the business is concerned. How does it apply?

In those districts where reasonable prices cannot be maintained due to the competitive conditions, it would seem advisable for those operating repair shops to file their rewinding price sheets, rental rates, service rates, and discounts with the local administration committee, which would, in turn, necessitate the price cutter doing the same. This should, to a great extent, stop the practice of price slashing, peddling, meeting competitive prices, etc., which is now so prevalent.

Established motor dealers handling used equipment, recondition this equipment in their shops and offer it to the public as reconditioned with a reasonable guarantee. Unfair second hand dealers do not as a general rule recondition the equipment they handle, but nevertheless in many instances offer it to the public as reconditioned and at lower prices.

We believe that under Article V, Section 18, this situation can be brought to the attention of the local administration committee, prices fairly stabilized, and unreasonable trade allowances prohibited.

Second hand dealers will then either have to go to the expense of reconditioning their equipment or else selling it "as is."

Too much emphasis has been given to "price." Electrical contractors specializing in industrial business maintain service shops, rewind, repair, rent, buy, sell and exchange, electrical equipment of all kinds, frequently maintaining large stocks for emergency and temporary installations, thus rendering to the industrial a complete electrical service, and should be compensated on the basis of service rendered and responsibilities assumed.

There is a wonderful opportunity at the present time for the motor specialist and repair shops to organize and form motor sections in the many communities where NECA has already established chapters. In order to take full advantage of the opportunities offered by the NRA, trade organizations are essential. In addition, there are many problems to be worked out with the motor manufacturers and wholesalers. The stronger our organization, the more the other branches of the industry will listen to us.

Are you satisfied with the present inadequate discounts allowed us by the motor manufacturers and wholesalers?

Are you satisfied with the unfair competition practiced by so many machinery dealers?

Are you satisfied with motor manufacturers competing with your service shops?

Do you think it fair that the motor manufacturers ask you to sell their equipment and then compete with you in the repair of it?

Are you satisfied with some of our own members'



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unfair practice of allowing discounts to those who are not entitled to discounts?

Our National Motor Section has been asking only for that which is reasonable and fair, but in order to have our requests allowed, we ourselves must be able to support them.

Let me appeal to the leaders in each section to get together, bring into our organization those in the industry, who do not already belong, and give the chairman of our National Motor Section the full support he needs and deserves so that we can all progress in a fair and equitable manner.

Action Through the National Motor Section

By J. Roland Stolzenbach

Chairman, National Motor Section

BY now we must all realize that action is the keynote of these times. To act intelligently we must learn the facts of our business. Recent activity in developing NRA codes has impressed us with this necessity. The next step is to organize these facts in such a way that they can be used to accomplish the desired results. The problems of our industry must be collected locally and nationally for careful study. The logical method is through national and local associations such as ours, with the hearty cooperation of every member. The third step is to reveal the facts and problems of our business so that prompt action can be obtained. Again, our national association is the logical outlet for revealing these facts.

Our National Motor Section was set up to learn the facts about the motor specialist and repair shop business, and to organize those facts so that the Section could protect and promote the best interests of its members locally and nationally.

The unified action which the times demand of all motor specialist and repair shops is to join our National Motor Section and work whole-heartedly under the contractor's code. Membership in our National Motor Section and subjection to the contractors' code will strengthen the motor specialist and repair shops' position locally and nationally because NECA is recognized by NRA as the official voice of the industry of which they are a part.

In past years we have heard much about the manufacturer's attitude, policies and business ethics. This year we step beyond all that and are busy submitting codes for each business. In place of a business policy we have what might be termed a business philosophy—that business men must so conduct themselves and each industry so govern itself that it will be possible for everyone to make a fair profit. The NRA is not an industrial Fascism, but an opportunity to cooperate in governing our business. The good it may do each of us depends upon how well we get together, how effectively we eliminate cut-throat competition, and how fairly we play the game towards everyone concerned.

It is to be expected that each member will do his part to eliminate any cut-throat competition and unfair practices that have existed in our industry. But there are forces outside our association that must be reckoned with. The electrical industry has been in the "big business" class for years and,

as we all know, is dominated by the large public utilities and by a few large manufacturers. They have been writing the commandments. We can never hope, as individuals, to have much voice in these commandments, but as a strong, active association we can demand our rights. We can strengthen our position locally by being active members in our recognized national association, which demands respect because of its power and strength.

At our 1932 convention I stressed seven points that should be a goal to work for in our relations with manufacturers. Some have been discussed many times and are taken from the original program mapped out several years ago. They are common-sense fundamentals of good business relations between producer and dealer.

When a large group of men in a similar business all have the same problems, it looks as though these complaints were real and not merely the expressions of snap judgment or opinion. Merely listing these complaints and talking about them will accomplish no particular good. We must analyze each point, find out what has been done to correct the evil, and offer constructive criticism or ideas for overcoming each obstacle.

To refresh your memories, the spirit of the program offered at the 1932 convention is repeated:



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Baltimore, Md.

1—Motor agents who qualify because of their facilities, organization and ability should become franchised motor specialists, or electric motor distributors.

2—A motor franchise should include territorial protection.

3—The franchise motor specialist, being responsible for services rendered on the make of motor for which he holds the franchise, should be compensated for that service.

4—Service shops maintained by manufacturers should confine their activities to their own equipment.

5—Machinery manufacturers should qualify as to the purpose for which motors purchased are to be used and their sales restricted to actual mounting or part of the machine built and sold.

6—Franchised motor dealers should obtain the same or better discounts as now given machinery manufacturers.

7—Greatly restrict Class B customers and the discount which has been given so indiscriminately.

On March 16, 1933, the joint committees on motor merchandising of NECA and NEMA conferred in New York City. We asked for this conference believing that the entire structure for the sale and distribution of motors by the manufacturer, the motor specialist, the machinery manufacturer, and the contractor not generally connected with the sale and installation of motor equipment and apparatus, should be reviewed for our mutual protection.

We asked for the conference also because it was becoming more apparent that motor manufacturers of NEMA were not maintaining their position in the apparatus field. Various practices had made inroads not only into their business, but also into the business of motor specialists with whom they had contracts or agency agreements. We believed that unless some policy was enunciated that would stabilize the industry, the entire motor situation would descend into a serious chaotic state, more detrimental to the manufacturers than the motor specialists.

At this conference I expressed the hope that the serious nature of the situation was recognized by NEMA, and I added:

"We are of the opinion that this matter is definitely in the hands of NEMA itself. If no stabilizing method or influence can be brought about at this time, we obviously, in justice to our own members who have placed confidence in us by their appointment of this committee, will be compelled to make a clear and definite statement of the conditions as they exist from our standpoint, and take such measures to protect ourselves."

At this conference each point of our program was discussed:

1—We were told by NEMA that dealer appointments were being selected more carefully, and they were getting representation that would be an asset. The number of dealers has been cut in half in less than three years. We were assured of cooperation in getting motor agreements signed only by motor specialists.

2—One of the large manufacturers has adopted the plan of territorial protection in certain selected territories.

3—Nothing definite could be reached regarding com-

pensation based on services rendered. We suggest that NEMA take a page out of the book of the plumbing industry and learn the advantage of such a policy.

4—Competition from manufacturers' service shops continues, and in some territories the complaints have been numerous. This direct competition by the manufacturers has been condemned by most of our members. There is no logical reason why such practice on the part of the manufacturer should continue. The electric motor, like the automobile, has passed the pioneer stage, and it is no longer necessary for the manufacturer to nurse his product so that it will stay sold. A manufacturer, to be successful and continue to grow, must build up a strong dealer organization. Then to hold dealers he must make every effort to keep them happy and prosperous.

5—The activity of machinery manufacturers in the sale of motors separate from their own equipment is becoming a serious problem. Unless the motor manufacturer takes some intelligent steps to curb such practice, the motor industry will degenerate into a price war.

6—The differential in discounts, showing favor to machinery manufacturers, is placing the motor specialist at a disadvantage. The machinery manufacturer is permitted to get any make of motor at a better discount, while we are pledged to be loyal to one make and take a smaller profit. We know that the spread between cost and selling price is sufficient to permit a better discount to the motor specialist, because one large manufacturer builds motors which are sold by a large national distributor to motor agreement dealers. If this national distributor can sell motors at 17 per cent discount and still make a profit, there is every indication that the motor manufacturer has a spread in his prices sufficient to meet our request.

7—The Class B list of motor purchasers has been somewhat revised. However, the list is not definite enough, nor is it restricted sufficiently to permit the motor specialist to make a legitimate profit on the larger orders.

This day of the New Deal is a good time to move the manufacturers out of the old rut. Most of the points we have been asking for were completely outlined in a series of articles written by Frank E. Boyd for "Electrical West." Here are some of his highlights that bring out our problems and what we must overcome:

So many of the policies set forth by manufacturers indicate a lack of clear thinking and consistency. Some actually reveal an appalling ignorance of the real facts underlying distribution. They have an air of theoretical "sales promotion" about them which sounds good but which assays very low percentage of real gold. Expediency appears to be the guiding factor rather than actuality.

Business, to exist, must be profitable. This principle must extend not alone to the maker of the motor, but to the distributors thereof, whatever or whoever they may be.

Another important step must be taken before one can proceed to a test of the real economy of any of the many means of bringing the motor from the manufacturer's plant to the user's premises. It is a determination of what that user wants thrown in with the raw motor in the way of service. It is these factors which complicate distribution and make of an otherwise simple process a long succession of costly little details, of which no one seems to be aware except the motor dealer. It is of these that the broad

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Explosion Proof Wiring—I

By C. W. Gustafson,
Chairman Article 32 Committee, N.E.C.

DURING recent years the need for a better and safer type of electrical installation in the hazardous industries has been asserting itself very forcibly. Electrical apparatus and wiring which is considered safe for ordinary application has shown itself unfit for installation in locations where flammable gases, vapors, dusts, and other easily ignitable flammable material are present.

Conditions have been considerably aggravated during the past decade by an increasing use of materials known to be hazardous. New materials and methods have been found for the application of finishes to automobiles, furniture and other manufactured articles; but unfortunately many of the materials, as well as the methods used for their application, introduced unusually severe hazards. Gasoline and other petroleum products of a highly flammable nature have found wide use in industry and commerce. Pyroxylin and compounds of which it is a part have come to be used for many purposes. The chemical industry has learned the secrets of produc-

ing many substitutes for natural commodities by synthetic means, often entailing the use of hazardous materials and processes. Industries producing flammable dusts have become more numerous and greater in extent.

Such increased production and use of hazardous materials has been attended by numerous fires and explosions, and in many, electric arcs or sparks have been the igniting medium. It should be remembered that, because of the nature of the hazardous materials, it is frequently difficult to determine even the approximate causes of fires and explosions which occur in plants where they are present. Very often eye witnesses are killed or are so badly injured that little can be learned of the causes or conditions which brought about the explosion or fire. Furthermore, in the more serious accidents, all material evidence is generally destroyed, with the result that the fire or explosion must be classed by investigators as being from some unknown cause for want of definite evidence. However, elsewhere on these pages will be found several

abbreviated reports of typical fires and explosions which have occurred in the hazardous industries through electrical causes. While these are but a few of a large number which might be detailed, they should be sufficient to prove conclusively that very special and individual treatment is needed for electrical installations in these hazardous industries.

In the study leading to the formation of present Article 32 of the National Electrical Code it became apparent that it was necessary to prescribe the proper forms of apparatus and wiring to suit the particular hazardous condition to which they would be exposed. It was recognized that an enclosed motor, for instance, which by test was found to be safe for installation in an atmosphere of combustible dust would probably be unsafe for operation where flammable vapors or gases were present. Conversely, while an enclosed motor designed to operate in an atmosphere of flammable vapor and air might be safe for use in a dusty atmosphere, it seemed unfair, in the interests of

Typical Cases of Hazardous Location

Automobile Body Plant, Detroit, Mich., April 23, 1927. The fire or explosion originated on the third floor of a five story building where lacquer spraying was done. It was due to the ignition of pyroxylin dust or residue by a spark from, or the overheating of, a mercury vapor lamp over a spray booth. The first explosion was enough to shake the pyroxylin dust into suspension in the air and this, together with the gases formed by the decomposition of residue resulted in a second explosion of great violence. Several workmen were killed outright by the blasts and others died later of their burns. In all, twenty-three lives were lost. Loss, \$2,000,000.

Furniture Factory, North Bennington, Vt., January 5, 1924. A spark from a motor in a spray booth ignited varnish spray inside of the booth. Loss, \$4,500.

Furniture Factory, Boston, Mass., August 18, 1926. An electric light bulb in a spray booth was accidentally broken. This

ignited the flammable vapors. Loss, \$197,000.

Clothing Factory, Toronto, Ont., March 13, 1927. An unprotected electric light had been permitted to lay lighted in a tray of celluloid buttons. The celluloid started to decompose and presently the vapors were ignited. The fumes prevented firemen from entering which greatly increased the extent of the loss. Loss, \$10,000 to \$20,000.

Dry Cleaning Plant, Harvey, N. D., March 19, 1928. A spark from an electric switch ignited gasoline vapor and caused an explosion in a small detached cleaning room. Loss, \$850.

Chemical Plant, Belleville, N. J., September 6, 1930. Fire was caused by the ignition of gasoline fumes by an electric motor used in pumping a solution of phosphorous oxy-chloride phenol and gasoline from the mixing tank to the crystalizing vat. Fire occurred when an employee started the electric motor which

caused the ignition of the gasoline fumes. The fire was held in check by sprinklers. Loss, \$2,700.

Paint and Varnish Works, Reading, Pa., August 28, 1928. Fire occurred in a paint mixing room where tanks were located. There were eleven 225-gal. tanks located on a turn table on which was also located an electric light on a drop cord which was used to examine the tanks occasionally. This light was apparently unguarded and it is thought that it broke directly over a tank and ignited vapors. An employee who was present did not see the bulb break, but heard glass falling and saw flames shoot from the tank immediately afterward. Loss, \$110,000.

Bulk Gasoline Station, Minot, N. D., July 3, 1928. Two persons lost their lives and two others were badly burned in a fire following an explosion in the basement of the warehouse of an oil company. A spark from an electric motor used to operate the pump which pumped gasoline

economy, to require a motor designed to a more rigid standard than was actually required.

It was necessary, therefore, to study the nature of the various types of hazardous materials and, if possible, arrange them into classes based on similarity of characteristics.

A survey of the field of commerce and manufacture revealed that the various forms of hazardous matter could be grouped into the following general types:

1. Flammable liquids, which may be divided into two classes, viz:
 - (a) Volatile flammable liquids which give off flammable vapors at ordinary temperatures.
 - (b) Relatively non-volatile flammable liquids which give off flammable vapors only at temperatures in excess of these ordinarily reached.
2. Flammable gases which form flammable or explosive mixtures with air.
3. Highly flammable solids.
4. Highly flammable mixtures which consist of combinations of a material in one of the foregoing classes with a non-hazardous substance as in the case of rubber cement, or a combination of two or more materials of the same or separate foregoing classes as in the case of pyroxylin lacquer.
5. Combustible dusts which may be

either carbonaceous or metallic in nature, either in themselves easily ignitable or capable of forming explosive mixtures with air.

6. Easily ignitable combustible lints, fibers or "flyings."
7. Combustible light material such as wood shavings and paper cuttings.

It was found that the locations where these various types of hazardous materials were involved could, for our purposes, be grouped into four classes and each treated separately. In Section 3201 of the National Electrical Code we find these four classes defined as follows:

Class I locations are those in which flammable volatile liquids, highly flammable gases, mixtures or other highly flammable substances are manufactured, used, handled or stored in other than their original containers.

Class II locations are those in which (1) combustible dust is thrown or is likely to be thrown into suspension in the air in sufficient quantities to produce explosive mixtures or (2) those where it is impracticable to prevent such combustible dust from collecting in such quantities on or in motors, lamps or other electrical devices that they are likely to become overheated because normal radiation is prevented.

Class III locations are those in which easily ignitable fibers or materials producing combustible flyings are handled, manufactured or used and which are hazardous through such fibers or flyings collecting on or being ignited by arcing contacts, resistors, lamps or similar apparatus. For combustible fiber warehouses see paragraph e of this section and section 3206 of this article.



The result of the breakage of an unprotected portable light in a bin of a flour mill.

Class IV locations are those in which easily ignitable combustible fibers are stored and handled (except in rooms where in process of manufacture) and which are hazardous through such fibers being ignited by arcing contacts, resistors, lamps or similar apparatus.

It is acknowledged that in Classes III and IV the materials involved are

Fires and Explosions from Electrical Causes

and other petroleum from the tank cars to storage tanks ignited an accumulation of flammable vapors. Loss, \$23,820.

Grain Elevator, Java, S. D., April 13, 1931. A single phase motor was being started by means of an open resistance starter. At the same instant a dust explosion occurred damaging the building considerably and seriously burning three men. Loss, \$2,000.

Grain Elevator, Huntington, Ind., October 18, 1926. An open squirrel cage motor located in the cupola had burned out during the afternoon. The motor had been removed for rewinding, at which time there was no evidence of fire. However, late that night fire broke out in the cupola, probably from a spark smoldering in accumulated dust, and total destruction resulted. Loss, \$21,985.

Feed Mill, South Bartonville, Ill., January 1, 1919. An electric spark is given as the cause of an explosion and fire in the grinding and mixing plant. Loss, \$750,000.

Mattress Factory, Derry, N. H., May 22, 1929. The fire was caused by ignition of loose flammable stock by an arc from an electric motor driving a sewing machine located between two mattress forming machines. Fire flashed rapidly over every floor causing the death of an elderly woman. Loss, \$30,000.

Hosiery Mill, Macon, Ga., December 17, 1926. Sparks from a switch controlling the card room motor ignited accumulated cotton lint clinging to the wall. The fire flashed up through an old elevator tower and into the attic. Automatic sprinklers held the fire in check, but when the fire department responded, considerable water was thrown into the building causing heavy water damage. Loss, \$2,000 to \$4,000.

Terminal Cotton Warehouse, New Orleans, La., June 5, 1919. This fire was caused by the breaking of one of the cast iron collector shoes on an electric crane and short circuiting the collector

rail. A slight arc resulted and molten metal fell on a quantity of baled cotton 10 ft. below, igniting some loose lint. The fire was discovered promptly and the damage confined to five bales of cotton. Two fires of similar type occurred in this same warehouse on March 10 and 16, 1916. The first resulted in a loss of about \$1,000 and the second about \$2,500.

Paper Mill, North Chattanooga, Tenn., February 29, 1928. Sparks from a short circuit in a two piece plug connector in a portable cord connected to a portable electric elevator in a paper warehouse ignited loose paper. A fireman was suffocated in fighting the fire. Loss, \$43,344.

Flour Mill, Omaha, Neb., December 18, 1931. One man was killed, several others injured and the building destroyed when an unprotected portable lamp was broken as it was being lowered into a flour bin. The sparks from the broken lamp ignited the suspended dust causing a terrific explosion.



The remains of a bulk oil station destroyed by an explosion caused by the ignition of gasoline vapors by an arc from an ordinary enclosed motor starting switch.

very similar in nature, but it will be noted that Class IV deals only with the storage of combustible fibers. The rules of this class apply principally to large combustible fiber warehouses where special conditions prevail.

Closely associated with the hazard of the materials themselves are the processes or methods by which they are used. To illustrate, let us assume a typical case, of a varnish or a lacquer in which a highly flammable liquid is used as the vehicle. Such a material, if in closed containers, could, under ordinary circumstances, be stored with safety on the shelves of a paint store, but a considerable hazard is introduced when the same material is applied by the spray method to furniture or other manufactured articles unless proper precautions are taken. Thus a study of the processes involving the various hazardous materials and the methods by which they are manufactured and used was an important step in the formation of Article 32.

It would obviously be impracticable to include in Article 32 a complete list of the types of factories or buildings which produce, use or otherwise handle the various hazardous materials we have discussed and to attempt to define the extent of the hazardous area in each. As a guide, however, several types of establishments in each class are to be found in the fine print notes following the definitions of the various classes in Section 3201, as follows:

Class I This class may include such locations as some parts of dry cleaning and dry dyeing plants, proxylin plastic manufacturing plants, spray painting establishments, gas plants, varnish manufacturing plants, and establishments or

industries involving similar hazardous processes or conditions.

Class II This class may include such locations as some parts of flour mills, feed mills, grain elevators, starch plants, sugar, cocoa and coal pulverizing plants, and establishments or industries involving similar hazardous processes or conditions.

Class III This class may include locations such as some parts of cotton and other textile mills, combustible fiber manufacturing plants, cotton gins, clothing manufacturing plants, cotton seed mills, woodworking plants and establishments or industries involving similar hazardous processes or conditions.

Class IV This class may include locations such as warehouses in which are stored or handled combustible fibers, such as cotton (including cotton linters and cotton waste), sisal or henequen, ixtle, jute, hemp, tow, coca fiber, oakum, baled waste, kapok, Spanish moss, excelsior and other similarly readily ignitable fibers.

The desirability of this grouping of hazardous materials has been proved by subsequent development and tests. It was found, for instance, that motors, controllers, and similar equipment intended for Class I locations must be of the explosion proof type while those for Classes II, III and IV locations are required to be of the dust tight type. An explosion proof enclosure is not necessarily dust tight and, therefore, Class I apparatus is not to be considered approved for Classes II, III and IV locations unless it has been specifically tested and listed for installation in these locations. Conversely, Class II equipment, while approved for Class III and IV locations, is not approved for Class I locations. The requirements for apparatus for each Class of location will be fully discussed in later installments.

The authority enforcing the Code is definitely charged with the responsibility of determining the existence

and extent of the hazardous area. This fact is clearly indicated by the introductory rule of Article 32 which states:

The provisions of this Article are intended to apply to locations in which authority enforcing this Code judges the apparatus and wiring to be subject to the conditions indicated by the following classifications. Where the apparatus and wiring are installed in rooms or sections in which the particular hazardous conditions do not prevail, such wiring and apparatus may be of the type approved for such locations.

We find further in the fine print notes following the rules defining the various classes the words: "This class may include some parts of, etc."

As has been previously pointed out, it would be quite impracticable to attempt to define in the Code the location and extent of hazardous area in every type of hazardous industry. As a matter of fact, conditions vary considerably even in establishments of the same kind, depending to a large extent on arrangement, type of materials used, and other factors. However, in the discussion which will appear in later installments, an attempt will be made to give some information concerning the treatment of representative establishments of the types most commonly encountered.

Study Industries

The inspector or contractor should use every opportunity to familiarize himself with the more important details of the various hazardous industries he encounters. Such a study may include:

1. A thorough study of the processes involved, including an investigation of the liquids, gases or solid substances which are to be used, scrutinizing these materials from the standpoint of ease of ignition, volatility, explosibility and general hazard rating.

2. A careful checking of the machines or devices which are to be used. This to determine whether or not the hazardous material will be confined within tanks, drums or piping, or whether or not there will be a possibility of leakage into the open room, either during normal operation or through accidents.

3. An inspection of the layout of buildings, either from building plans or by actual visual inspection. This to determine whether one small section of the plant should be thrown into the hazardous classification or whether or not the hazardous conditions extend to all parts.

Electrical Contracting, October, 1933

4. Consulting and co-operating with other inspection authorities, particularly Underwriters' special hazards inspectors and engineers who are familiar with conditions in establishments of a nature similar to those under consideration.

5. Frequent reinspections of plants involving hazardous processes or conditions to determine what conditions prevail during actual operation.

6. A study of statistics and reports on fires and accidents suffered in properties where hazardous processes are involved.

Matters such as ventilation, confinement of hazardous materials, fire cut-offs and housekeeping may have important bearings on classification and the extent of the hazardous area. Brief mention of these factors at this point may be valuable.

Theoretically it is possible to provide ventilating systems which would reduce the amount of flammable gas, vapor or dust in a room or building to the point where the resulting mixture would be below the lower explosive limit. However, under practical conditions it would be unwise to place complete confidence in any ventilating system, whether artificial or natural, for weather conditions, direction and velocity of wind, possibility of the failure of ventilating system and other factors may result in effects more favorable to an explosion than those existing without ventilation. In practically all instances, therefore, one is forced to eliminate from consideration entirely, the possible value of ventilating systems in his attempts to determine the extent of a hazardous area.

In many processes hazardous materials are confined within closed tanks, piping or other enclosures, and in the interest of economy every effort is made to maintain the system free from leaks. Yet in spite of the best of maintenance leaks develop, containers are ruptured or piping bursts because of mechanical disturbances which permits the issue of hazardous gases or vapors. Close study must be given individual cases to determine whether or not special dispensation should be given processes where the hazardous materials are handled in closed continuous systems. In most instances the worst conditions should be assumed in the interest of safety.

In the older type of manufacturing plants it is common to find all processes conducted under one roof with no attempt at segregating especially

hazardous processes from the non-hazardous by fire walls. In the more modern establishment, however, we usually find these hazardous processes conducted in a separate building or in a section of the main building cut off from the remainder by standard fire walls. Such cut-offs should be given due consideration in determining the extent of the hazardous area. To illustrate, let us assume a metal working establishment where the finished articles are painted by the spray process, using a pyroxylin lacquer, which process is conducted in a fire resistive addition to the main plant, cut off by a standard fire wall. Here, of course, assuming no other hazardous process in the main building, the hazardous area is represented only by the spray painting department.

The grade of housekeeping maintained, while of small effect from our standpoint in establishments where

flammable vapors or gases may be present, is important where the other types of hazardous materials are concerned. However, the inspector has no assurance that favorable conditions of housekeeping and general care will prevail continuously. A change in management or personnel might cause conditions to decline to such a degree that the most rigid standard of electrical construction would not be sufficient. Faced with such considerations one must disregard to a large degree housekeeping and general care in determining whether or not certain premises should be classed as hazardous.

In the foregoing the general plan and scope of Article 32 has been discussed, touching on the problem in a general way. In the forthcoming articles, the specific rules for each class of hazardous locations will be treated in detail.

National Motor Section

(Continued from Page 15)

sweeping generalities are made. The dealer knows, however, only too grimly, that it is these consumer wants which eat up all the theoretical profit supposed to be amply provided by the arbitrary to make such contact. . . .

In modern salesmanship, we find everywhere more emphasis on the personal relationship, on the quality of contact, and the owner of the small business in a community has the best opportunity to make such a contact. . . .

Mutual agreements between manufacturers and dealers are mutual only if the manufacturer agrees to accept some obligations on his part. The time has come for big concerns to abandon the idea that they have private preserves for their own business hunting. Large business cannot exist without stable small business. The manufacturer who serves his dealers best will profit most—to borrow the Rotary slogan. . . .

If the truth were known, I daresay most of the larger manufacturers' much-advertised service shops probably are operated at a loss. Yet it is doubtful if the real situation ever becomes known to their chief executives, since those in charge of such operations are anxious to maintain and build up an organization which will give them greater importance, regardless of the best interests of the company. . . .

Distribution more and more reverts to intelligent dealerships. Even the automobile, the washer and the refrigerator manufacturers who wanted to exert control completely down the line have had to withdraw and revert to dealer policies. . . .

Notably, contractors are weak in their support of their own trade associations. They expect a great deal from such associations, want them to cure all of the evils of the business overnight, but fail to see that they must pay the price in the form of dues and personal interest

and participation. If contractors want their interests properly protected, nationally or locally, through their trade associations, they can get such protection only by paying for it. A cheap operated trade association, as with anything else cheap, gives just what service is paid for and no more. . . .

It behooves everyone in business to secure trade association cooperation that may affect his immediate and future prosperity. I strongly urge each member to become an active force in helping us reach our goal.

Bid Peddling

(Continued from Page 11)

in his proposal the bid of any sub-contractor, in the event that he is awarded the general contract, he must award that sub-contract to the sub-contractor whose bid he used without taking any further bids. If the general contractor proposes doing any of the work with his own forces, and is qualified to do so, he must so state in his proposal.

All supplemental codes shall provide for the enforcement of the provisions of this Section 10 in the master code.

With such searchlight exposure of the tricks of the trade of the unscrupulous bid-peddling racketeers, this section in the construction industry's proposed law not only lays bare the evils but provide the means for curbing them. Every agency within the industry is sworn in by this master code to enforce these laws.

electrical contracting

With which is consolidated Electrical Record

S. B. WILLIAMS, Editor

EXPLOSION-PROOF WIRING

PROBABLY no part of the National Electrical Code is so little understood as Article 32 on Hazardous Locations. The subject matter is relatively new and the necessary fittings and apparatus are comparatively recent on the market.

The responsibility for determining whether or not a specific location is hazardous is definitely left to the local inspector and he has not always been able to judge correctly.

Because of the resulting confusion and lack of understanding ELECTRICAL CONTRACTING has arranged with C. W. Gustafson, chairman of Article 32 Committee, for a series of six articles on this subject. The first appears in this issue and the remaining ones will appear serially in the next five issues.

After the introductory article, an article will be devoted to each of the four classes of hazardous locations and the final article will answer a large number of the most often asked questions.

As these are the first authoritative articles to appear on explosion-proof wiring it is believed that they will prove of very great value to our contractor and inspector readers.

It will be seen in the articles that this form of wiring specifically requires a very high quality of equipment. Where the Code generally is set up to cover minimums, hazardous location wiring requires explosion-proof equipment. The care that must be exercised in the design and manufacture of equipment for this purpose that will pass the tests of the Underwriters' Laboratories can only result in quality wiring materials.

The wiring of hazardous locations is at least one place where a contractor can count on no job or material skimping. It must be quality throughout if it is to pass inspection.

THE N. E. C. A. 1933 CONVENTION

HERE, in this issue, is the thirty-third annual convention of the National Electrical Contractors Association. Originally scheduled for Indianapolis in October, it was abandoned in order not to tax the pocket-books of interested members and the Indianapolis industry. To preserve the continuity of the conventions, however, this year's convention, at the request of the N.E.C.A. Executive Committee is being held in the pages of this issue of ELECTRICAL CONTRACTING.

In spite of the fact that the convention is being held in such an "unconventional" manner this convention is, in many ways, probably the most important ever held since the organization meeting in Buffalo in 1901.

The electrical contracting industry is about to embark on a new plan of competitive operation. The NRA code for the electrical construction industry has been designed to revolutionize the business and take from it the hazard of gambling.

What is it and how is it going to operate? That is the question that every electrical contractor wants to know.

ELECTRICAL CONTRACTING is very happy to have been able to place its October issue at the disposal of the National Electrical Contractors Association for use as the 1933 convention, particularly as it is of just as vital interest to non-members as to members.

THE UNCONTROLLABLE CONDITION

WHILE presenting the report of the committee on electrical fires to the convention last month of the International Association of Electrical Inspectors, the chairman of the committee made one very illuminating statement that perhaps will shed a little different light on the subject.

He said that electrical fires, as a rule, are small in the first instance; the loss, as a rule, is due to surrounding conditions, over which the electrical inspector has no control.

When a person talks about reducing the standards of the National Electrical Code how often does this factor enter his thinking? Is he not perhaps more often thinking only of the installations where no fires have occurred?

It is not enough to say that since electrical fires have occurred in so few buildings, as compared with all the wired buildings, we are overestimating the hazard. We must take our cue from the fires themselves.

Conditions over which the inspectors have no jurisdiction bring about the big loss. The only protection we can have, therefore, is wiring that is not built down to the minimum, but wiring with a reasonable factor of safety.

We must use the same kind of thinking with our wiring that an engineer uses in designing a bridge. He uses a factor of safety to take care of the conditions over which no control can be exercised, such as floods, population growth, extra heavy loads, etc. There is not a bridge in this country that could not have been installed for a fraction of its cost had it been designed only for the average every day conditions. Furthermore, a record of the life of bridges will show that only a small percentage have been called on to withstand the higher standards to which they were built. But was it not worthwhile?

Let us look at wiring in the same fashion. Instead of crying for wiring with little or no factor of safety let us insist on a factor to take care of the uncontrollable conditions. It costs a little more to be sure but far, far less than the extra spent in bridge construction to provide for safety.

LABOR'S CHALLENGE

AT the NRA public hearing last month on the electrical contractors' code a most unusual document was presented by the International Brotherhood of Electrical Workers, which should cause some very serious thinking on the part of all electrical contractors.

At the very beginning the I.B.E.W. brief stated:

As an active participant in the building enterprises of the country, representing about 65 percent of the industry, we have come to oppose a code presented by an organization representing about 45 percent of the electrical contractors. The International Brotherhood of Electrical Workers and its more than 2200 employers, members of the electrical contracting industry, with whom it has permanent agreements, is a truly representative group. Moreover, it is truly national, comprehensive and properly distributed geographically. It is the oldest organization in the electrical contracting industry.

An analysis of the February, 1933, membership list of the National Electrical Contractors Association throws serious doubt upon the claim that it is truly representative.

Then towards the conclusion of the brief the I.B.E.W. suggested that a National Code Authority composed of nine members should be appointed by NRA; three contractors, three named by the union and one named by each of the secretaries of Labor, Interior

and Agriculture.

It will be noticed that the N.E.C.A. by this suggestion is not to name any member of this body.

Now we have no idea that NRA will seriously consider this suggestion, nor do we believe that the electrical contracting industry would submit to any regulation of its business by labor. Nevertheless, the thinking of labor is significant.

This brief of the I.B.E.W. is a challenge to the contractors of the United States. Are they willing to permit any such statements by organized labor to go unchallenged? Are they willing to permit organized labor to publicly state that it is more representative of the contractors than the contractors' own national organization?

Surely such statements must have some foundation in hope if not in fact. The implication in the statement, of course, is that the union does represent all employers of union wiremen. Is this a fact? Have contractors employing union mechanics delegated any of their rights to the I.B.E.W.?

There is but one answer to this challenge and that is for the contractors to organize. The National Electrical Contractors Association will be just as representative of the contractors as they will permit it to be. Its activities can be only those that its members demand.

PROMOTIONAL RATES

SINCE our remarks last month on the opportunity for the contractor in the new low promotional residential rates for energy in St. Louis, instances of low promotional rates in other cities have been brought to our attention. One, one and a half and two cent last step rates are now in use and appear to be producing business.

Politicians aim their attack at the top residential rate but the effect is of little value to the contractor. The rate that the contractor is interested in is the last step. If it is low and quickly arrived at it can be depended upon to help materially to open the market to many devices which require installation.

The activities of the politician help nobody because the actual saving to the public is so pitifully small per individual consumer. Low last step rates, however, are promotional in character. They will help hasten new load and in the long run prove very advantageous to the utility, the public and the whole electrical industry.

Explosion-Proof Condulets



Junction Condulet



Junction Condulet



Push Button Switch



Tumbler Switch



Tumbler Switch



Sealing Condulet



Circuit Breaker

JUNCTION CONDULETS,
THREADED HUBS

JUNCTION CONDULETS,
UNION HUBS

PANELBOARDS

LIGHTING FIXTURE CONDULETS

PORTABLE LAMPS

PUSH BUTTON SWITCH CONDULETS

TUMBLER SWITCH CONDULETS



Lighting Fixture



Floodlight

FLOODLIGHTS

CONDULET UNIONS

BOX CONNECTORS

Explosion-proof Condulets are carefully de-
ments of the Underwriters' Laboratories for

Catalog Sent



Panelboard



Plug Receptacle



CROUSE
SYRACUSE,

CH176

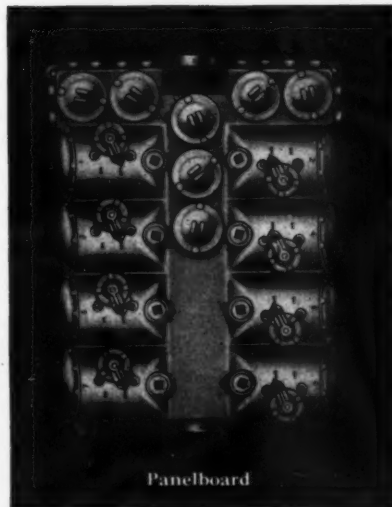
For Hazardous Locations



Plug and Receptacle

PUSH BUTTON STATIONS
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CONDUIT COUPLINGS
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Panelboard

signed to comply with the exacting require-
 use in hazardous locations.

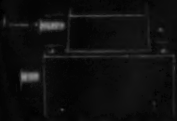
Upon Request.



Junction Condulet



Junction Condulet



Tumbler Switch



Push Button Station



Receptacle and Switch



Junction Box

-HINDS
 N. Y., U. S. A.



Secondary Breaker



Connectors



Starting Switch Condulet

KILLARK

EXPLOSION RESISTING FITTINGS



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These fittings are designed for use in hazardous locations, where vapor or dust constitutes a menace to life and property through the possibility of an explosion. They meet the rigid requirements of the Underwriters Laboratories, and are thoroughly worthy of your confidence.



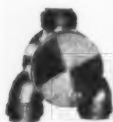
Type GEC

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N.E.C.A.

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Electrical Contractors of Hartford County, Conn., covering the jurisdiction over Hartford County, Conn., to be known as the Hartford County Chapter. Edward M. Baldwin, 210 Pearl Street, Hartford, President. John Teufel, 185 Ann Street, Hartford, Secretary-Treasurer.

Freeport Illinois Electrical Contractors' Association covering the jurisdiction over Stephenson County, Illinois, to be known as the Stephenson County Chapter. Marvin R. Neil, 6 South Galena Avenue, Freeport, President. Kenneth Nagel, 209 W. Stephenson Street, Freeport, Secretary.

Rockford Electrical Contractors covering the jurisdiction over Rockford, Illinois, to be known as the

Rockford, Illinois, Chapter. C. A. Pottinger, 624 Seventh Street, Rockford, President. Paul H. Wilson, 113 South Madison Street, Rockford, Secretary.

Electrical Contractors' Association of South Bend, Indiana, covering jurisdiction over St. Joseph County of Indiana, to be known as the St. Joseph Valley Chapter. Charles Colip, 114 W. Wayne Street, South Bend, President. L. J. Brehmer, 502 East La Salle Street, South Bend, Treasurer.

Erie Electrical Contractors' Association covering the jurisdiction over Erie and Crawford Counties, State of Pennsylvania, to be known as the Erie Chapter. Herbert Garvin, 113 W. 7th Street, Erie, President. Edgar Garvin, 115 W. 11th Street, Erie, Secretary.

The industrial electrical contractors in the Southeastern States covering the jurisdiction over problems affecting the interests and welfare of all industrial electrical contractors in the following states, without prejudice to the local membership jurisdiction of any local N. E. C. A.

(Continued on page 40)

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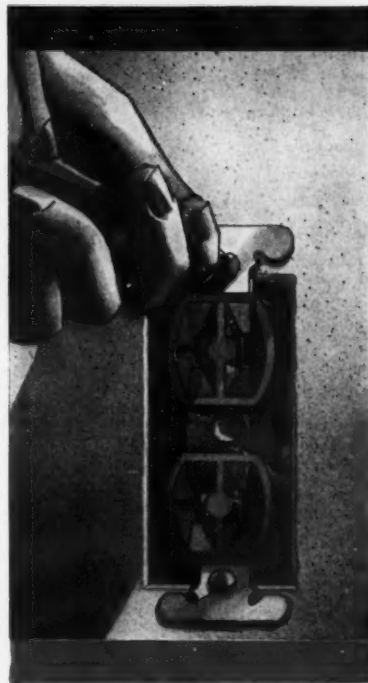
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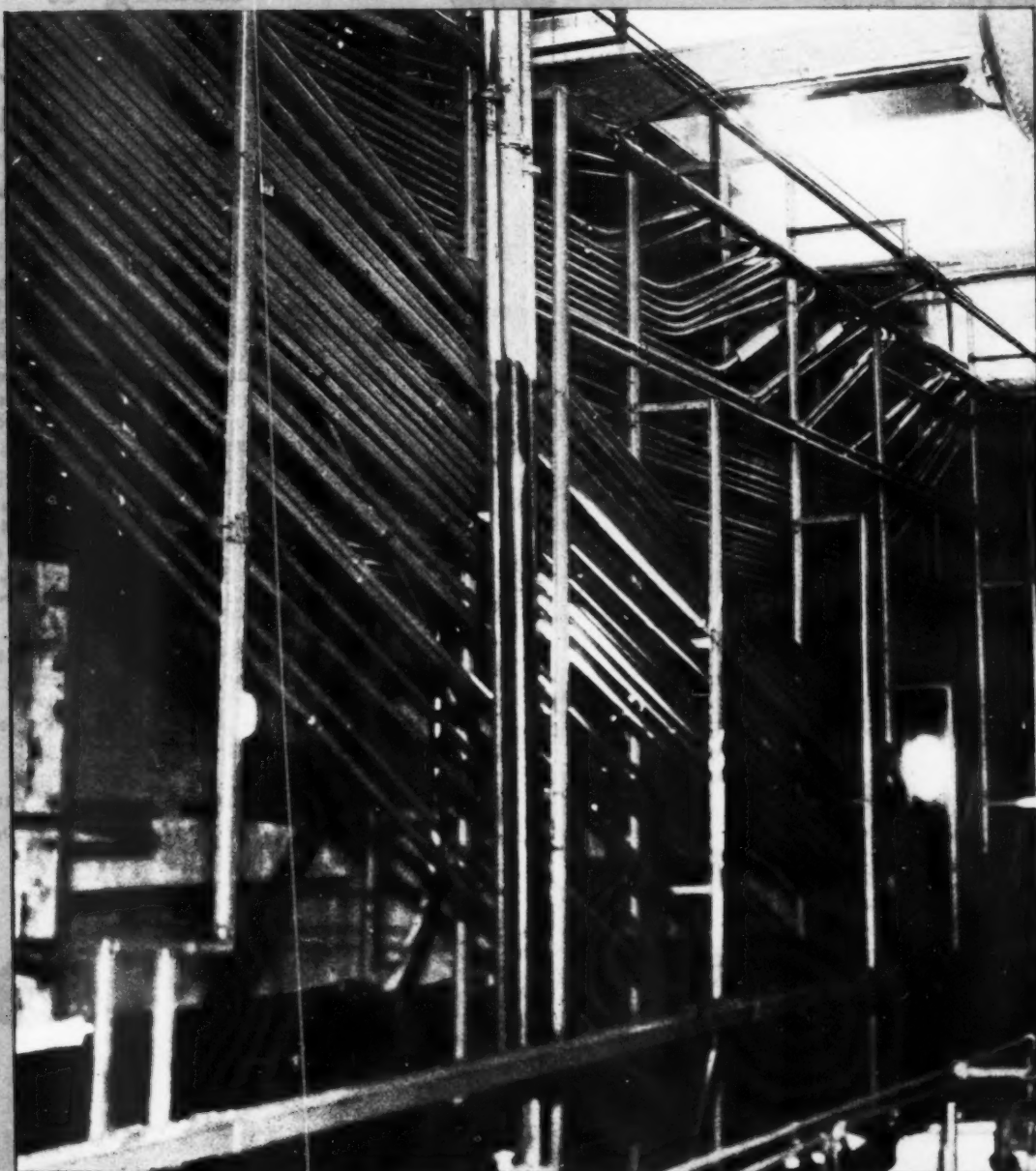
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Not only have they mentioned savings due to faster and better work, but also because of the elimination of many manufactured ells. It is pointed out, too, that all this makes it easier to pull in wire and cable.

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GREENLEE TOOL CO., Rockford, Ill.

Meeting the Problems of Hazardous Location Wiring with Appleton Explosion-Proof Fittings

ELECTRICAL wiring in hazardous locations requires the best in explosion-proof fittings. Appleton Explosion-Proof Fittings (a few of which are illustrated on this page), have undergone exhaustive tests and practical usage—and meet the requirements of the Underwriters Laboratories for use in hazardous locations. They are made of malleable iron, give thorough protection, are sturdy, and the Cadmium Finish makes them rust resisting.

Write for Bulletin 1002 containing complete information on all types of Appleton Explosion-Proof Fittings. It will gladly be sent upon request without obligation.

Sold through Jobbers

APPLETON ELECTRIC COMPANY

1749 Wellington Ave., Chicago, U. S. A.

New York—150 Varick St.

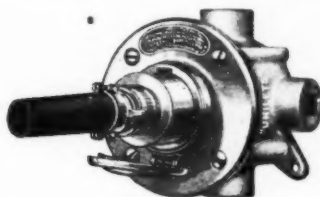
Los Angeles—340 Azusa St.

San Francisco—655 Minna St.

Manufacturers of Appleton Constant Duty and Portable Type Reelites

APPLETON Explosion-Proof UNILETS

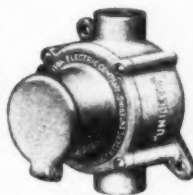
Registered U. S. Pat. Off.



For Hospitals

Type "CPS" Unilets

Also embodies exclusive Dead End Contact feature. No live contacts exposed to atmosphere.



For Industrial Plants



Type "GRU" UNILETS

Used as junction boxes, are of the round type $4\frac{1}{8}$ " in diameter and furnished with a threaded screw on brass cover. Particularly designed for gas pump and gas station wiring.



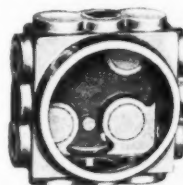
Type "GRUO" UNILETS

Used as junction boxes—Termed a Universal Unilet because practically any combination of Outlets can be made.



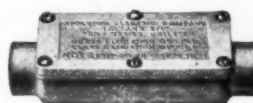
Explosion Resisting Switches

Operated by means of a shaft extending through an accurately machined bearing surface.



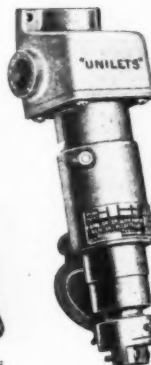
Type "GRUJ" UNILETS

Used as junction boxes. Termed a Universal Unilet because almost any combination of outlets can be made. (Illustration herewith shows cover removed).



Type "ERS" UNILETS

Rectangular shape—designed to provide a narrow yet practical fitting.



Type "CES" UNILETS

Plug Receptacles embodying exclusive Dead End feature.



Type "EGK" UNILETS

Consist of Interlocking Safety Switch and Plug Receptacle mounted in Unilet Body.

STANDARD FOR BETTER WIRING

CENTRAL RIGID STEEL CONDUIT

Greater WALL THICKNESS

Combining the greatest wall thickness and weight of any metal wiring material with easy bending qualities, "Central" enjoys a nationwide popularity.

Higher

RESISTANCE to ARCING

You can appreciate this advantage when you consider that "Central" has twice the resistance to arcing and short circuiting of any other metal raceway.

More DURABLE

The greater wall thickness of "Central" naturally offers maximum resistance to crushing and mechanical injury incident to building construction such as heavy wheel-barrow and misplaced nails.

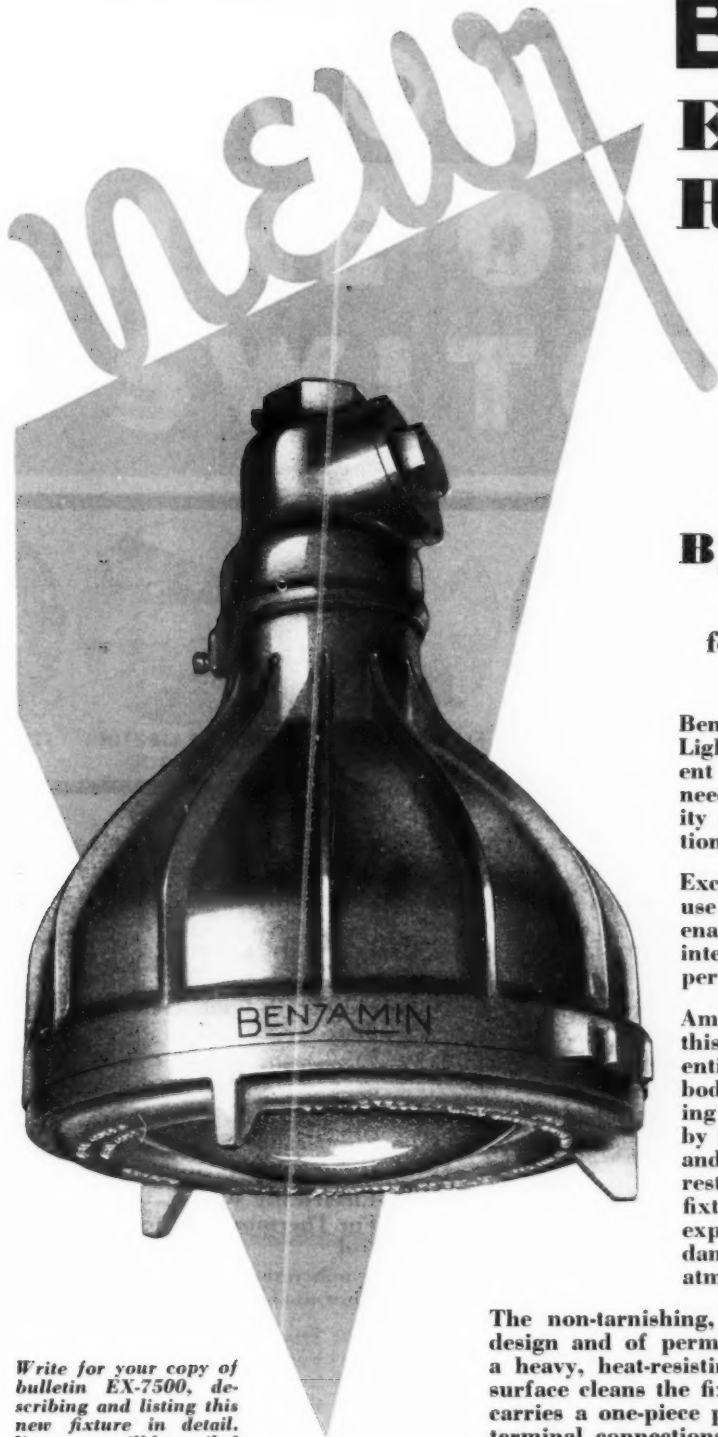
Greater TENSILE STRENGTH

In strength and lasting qualities, you will find "Central" has no peer. In addition to possessing greater tensile strength "Central" meets the full approval of the National Electric Code as a dust proof and moisture proof conduit for use in all hazardous locations.



WRITE FOR OUR NEW FOLDER "Why Rigid Steel Conduit"

CENTRAL TUBE COMPANY . . . PITTSBURGH, PA.



Write for your copy of bulletin EX-7500, describing and listing this new fixture in detail. Your copy will be mailed at once.

BENJAMIN TRADE MARK

EXPLOSION RESISTING FIXTURE

listed

**By Underwriters'
Laboratories**

**for Class I, Group D Hazardous
Locations**

Benjamin announces an Explosion Proof Lighting fixture of new and radically different design built to meet the long-standing need for a fixture combining improved quality of illumination with dependable protection against explosion hazards.

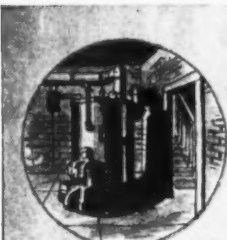
Exceptional strength in every part and the use of deep-threaded, metal-to-metal joints, enable this fixture to withstand repeated internal explosions without breaking down or permitting flame to escape.

Among the outstanding design features of this new Benjamin fixture is the method of entirely enclosing the reflector within the body of the unit. The improved heat radiating efficiency of this design, made possible by the heavy ribbing of the aluminum body and the absence of an exterior reflector to restrict the free circulation of air about the fixture, assures that the temperatures of exposed surfaces are safely below the danger point of igniting the surrounding atmosphere.

The non-tarnishing, aluminum alloy reflector is unique in design and of permanent high efficiency. It is protected by a heavy, heat-resisting cover glass; wiping its smooth outer surface cleans the fixture. The separable hood of the fixture carries a one-piece porcelain socket with conventional wiring terminal connections. A removable screw plug in the hood gives access to the wiring. The fixture accommodates 150 and 200 watt lamps.

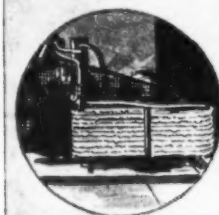
BENJAMIN ELECTRIC MFG. COMPANY
DES PLAINES (Chicago Suburb), ILLINOIS

SANGAMO MAKES



**OIL BURNER
CONTROL**

which helps you sell
16 TIME-SWITCH
MARKETS—



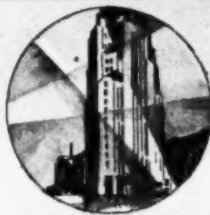
**ICE MACHINE
DEFROSTING**



**APARTMENT HOUSE
LIGHTING CONTROL**



**BEACON LIGHTING
CONTROL**



**FLOODLIGHTING
CONTROL**



**AIRPORT LIGHTING
CONTROL**



**STREET LIGHTING
CONTROL**

Your 16 markets for the sale of time-switches are illustrated—go after them all. Your markets are unlimited in sales opportunities. Remember, too, that no matter what the application, you will find a Sangamo which will take care of it perfectly, economically and efficiently.

HERE'S THE LINE THAT FITS ALL YOUR NEEDS:

VS—Synchronous
VW—Electrically Wound
VSO—Synchronous Outdoor
VSZ—Synchronous Astronomic Dial
VSOZ—Synchronous Astronomic Dial, Outdoor
VSD—Synchronous Duplex
VWD—Electrically Wound Duplex
TC—Electrically Wound, Conduit Base

TCO—Electrically Wound, Outdoor
TCZ—Electrically Wound Conduit Base, Astronomic dial
TCOZ—Electrically Wound Astronomic Dial, Outdoor
VW22—Electrically Wound—For Thermostatic Control
VS22—Synchronous—For Thermostatic Control

Form VW—Electrically wound movement with jeweled balance and non-magnetic, non-rusting, temperature compensated hair-spring, with 10 hour reserve.

Form VS—Low speed, high torque, self-starting synchronous motor operates time-switch unit. AC only.

Type T—Electrically wound, giving extreme precision accuracy. Single, double and triple pole with single or double-throw contacts. AC or DC. Conduit pry-outs on back, bottom or side on Type TC.

SANGAMO ELECTRIC COMPANY

MAKES A COMPLETE LINE OF TIME-SWITCHES

QUICK DELIVERY FROM STOCKS IN ALL JOBBING CENTERS

Sangamo Time-Switches have a nation-wide distribution—You can get them immediately from jobber stocks in every distribution center.

This means no waiting—no lost jobs through inability to get the necessary time-switch.

When you land that order calling for time-switches be sure they're SANGAMOS—then call your Sangamo jobber and he'll make the delivery quickly.

You can't go wrong by using Sangamo Time-Switches — your jobber will tell you that.

PRICED \$24.00 and up, retail



BILLBOARD LIGHTING
CONTROL



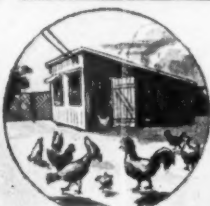
ELECTRIC SIGN
CONTROL



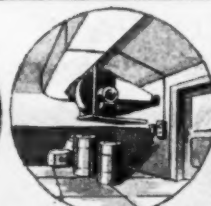
VENTILATION CONTROL



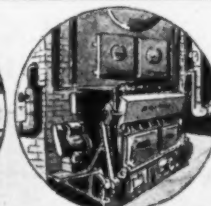
DISPLAY WINDOW
LIGHTING CONTROL



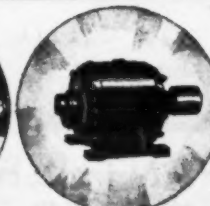
POULTRY HOUSE
LIGHTING CONTROL



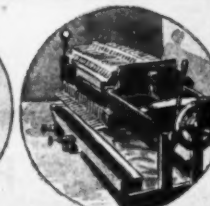
BLOWER OPERATION
CONTROL



AUTOMATIC STOKER
CONTROL



MOTOR
CONTROL



OIL FILTER
CONTROL

COMPANY SPRINGFIELD ILLINOIS



Here They Are — Look Them Over

Here's the line of Panther and Dragon Tapes. Panther Friction Tape is made in Nos. 8, 4, 2 and 1 rolls. No. 1 and No. 2 are packed in attractive counter display cartons. No. 8 also comes in a handy package of ten rolls if desired. Dragon Friction and Rubber Tapes are made in 8 and 4-ounce rolls.

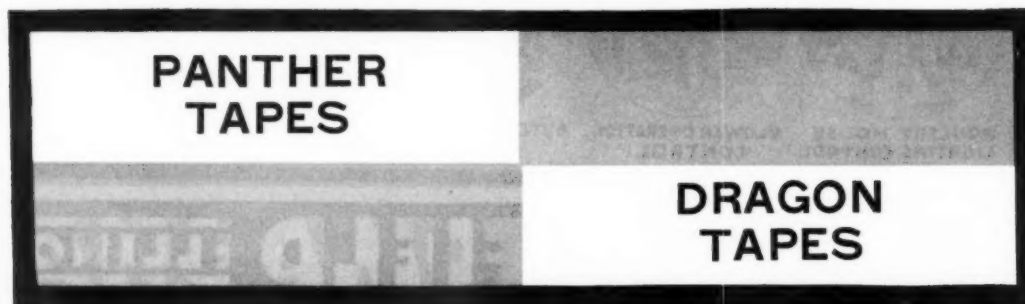
All are wrapped and sealed in cellophane to keep them fresh for use. All are wound on distinctive green cores so you can tell what you're using. All are backed by the Okonite reputation and all are sure to please you whether you buy them for resale or for use in your own work.

HAZARD INSULATED WIRE WORKS

Division of

THE OKONITE COMPANY

Factories: Wilkes-Barre, Pa. Passaic, N. J.



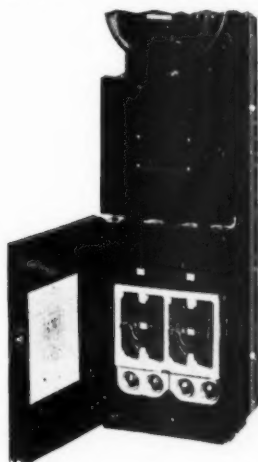


NOW—MORE THAN EVER The Contractor's Profits will Depend On the *INSTALLED COST* of Materials!



Bull Dog Control and Distribution Apparatus is designed from the "Field viewpoint" rather than the "Factory viewpoint". For many of the best Bull Dog Wiring Features are the result of suggestions from Contractors and Electricians who,

confronted daily with practical wiring problems, certainly know what is needed in Electrical Apparatus to make their Installations—Safe, Simple and Economical.



**THERE'S BULL DOG QUALITY
PLUS IN THIS NEW SEQUENCE
DISTRIBUTION PANEL**

**NO SIDE OR CROSS-OVER
WIRING NECESSARY**

**ALL HEAVY WIRES INSTALLED
AT ONE END; SMALLER LIGHTING
CIRCUIT WIRES AT OTHER END.**

**TOP and BOTTOM wiring Gutters
are proportioned accordingly**



Cat. No. 551204 in Sequence
with Meter Test Box, and Meter

**CABINET
ONLY 7 1/2" WIDE X 12" HIGH!**

Cat. No. 551204
Main Service Switch, Range Switch and
Lighting Distribution Panel

NOTE THESE UNIQUE BULL DOG PATENTED WIRING FEATURES

**SOLDERLESS CABLE CONNECTORS
SAVE TIME and MATERIAL**

For Stranded Wire



Strip the wires
of insulation.



A quick twist
with pliers
spreads the individual
strands.



Cable connected,
with perfect Contact
for each individual
strand.

PLUG FUSE CIRCUITS

ARE QUICKLY WIRED



NO LOOPS!

NO BENDS!

Insert straight wire under adjustable screw.

Tightening the screw kinks and locks wire in place.



BULLDOG ELECTRIC PRODUCTS CO.

DETROIT MICH. U.S.A.

Safety Switches
Switchboards

Fusenters
pro-DUCT

SAFtoFUSE
Bus-DUCT

Panelboards and Cabinets
Trol-e-DUCT

EVERY TYPE OF WIRE OR CABLE...

DEPENDABILITY of product—and dependability of source of supply—these are the important factors in purchasing electrical wires and cables. Meeting specific requirements for all types of installations—establishing enviable service records in every part of the world—American Steel & Wire Company Electrical Wires and Cables are the choice of industry. It will be profitable for you to investigate their application to your specific transmission, distribution and wiring problems.

AMERICAN STEEL & WIRE COMPANY
ELECTRICAL WIRES
AND CABLES

Type "H" Cable

Triple "L" Lead Less Laid Submarine Cable

Left—Reliance Weatherproof Wire. Center—Varnished Cambric Cable. Right—Rubber Covered Wire.

FOR EVERY TYPE OF INSTALLATION

1831

MORE THAN
100 YEARS
OF PROGRESS
IN
WIRE MAKING

1933

AMERICAN STEEL & WIRE COMPANY

208 South LaSalle Street, Chicago
 94 Grove Street, Worcester

SUBSIDIARY OF UNITED STATES STEEL CORPORATION
 AND ALL PRINCIPAL CITIES

Empire State Bldg., New York
 First National Bank Bldg., Baltimore

Pacific Coast Distributors: Columbia Steel Company, Russ Building, San Francisco

Export Distributors: United States Steel Products Company, New York



HE WHO SERVES BEST PROFITS MOST

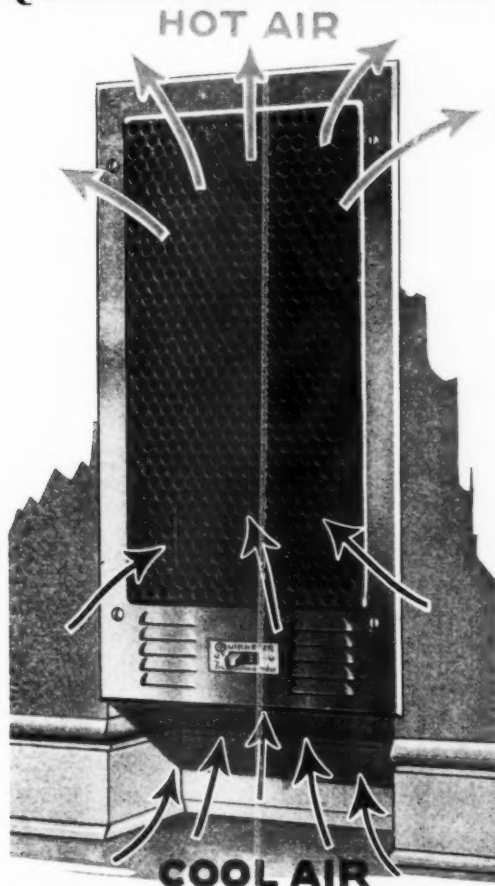
THE **FA** QUIKHETER WILL HELP YOU TO SERVE YOUR
CUSTOMERS TO THEIR COMFORT AND ECONOMY

In Comfort

When the chilly mornings and evenings come.

In Saving of Real Money

By shortening the time of operation of the main heating plant. The plant need not be operated to take the chill off mornings and evenings during the spring and fall. The **FA** QUIKHETER will do this job to better advantage at a cost of from one to three cents a day.



THE **FA** QUIKHETER

Is designed and constructed on practical principles to quickly and economically heat each and every room as shown on the thermometer.

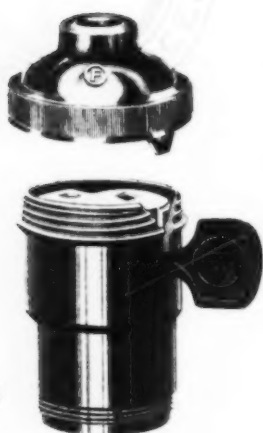
— • —

FOR AUXILIARY HEATING

*Quick - Clean - Safe
Economical*

Send for Bulletin

Frank Adam
ELECTRIC COMPANY
ST. LOUIS

BAKELITE
SOCKET

Every electrical contractor is entitled to a fair profit and this is the complete line of wiring devices that will help him earn it!

The CIRCLE F line of wiring devices is not just ordinarily good but of that thorough quality that makes for a dependable wiring job and, of high importance to every conscientious electrical contractor, a satisfied customer.

With the CIRCLE F line you are equipped with every practical device necessary to do a complete wiring job—an all-embracing line to which are added new items that make it one of the most modern in the wiring device field.

There are the CIRCLE F Bakelite sockets—beautiful to look at, non-tarnishing bodies that

are thoroughly shock-proof and sturdy enough to stand the gaff of hard, exacting service. One of the items in this complete line that is proving to be a good profit producer.

There is the "3200" line of duplex switches, receptacles and pilot lights—ten distinct combinations that fit any standard duplex receptacle plate. This line finds many applications in homes, hospitals, schools, stores and small industrials.

Look into the profit possibilities of the CIRCLE F line—your wholesaler's salesman has some mighty convincing information. Ask him.

10 PRACTICAL COMBINATIONS

IN THIS NEW "3200" LINE AND THEY FIT ALL STANDARD DUPLEX RECEPTACLE PLATES:

Bulletin 259 illustrates these combinations—ask your wholesaler for a copy or write direct to us.



No. 3206



No. 3201



No. 3207



No. 3209

PATENTED July 29, 1930.
No. 1,771,498.



CIRCLE
TRENTON



MFG. CO.
NEW JERSEY

NEW YORK . CHICAGO . BOSTON . BUFFALO . PITTSBURGH . ATLANTA . SEATTLE . SAN FRANCISCO . LOS ANGELES
DENVER . ST. LOUIS . PARKERSBURG . CLEVELAND . INDIANAPOLIS . DALLAS . NEW ORLEANS . DETROIT
RICHMOND . PHILADELPHIA . PORTLAND . BALTIMORE

REVOLUTIONARY



IN DESIGN

STARTLING
in performance

AMAZINGLY SMALL
in size

The new Bulletin 709 across-the-line switch opens new possibilities to electrical contractors.

Here is a solenoid-operated starter so small that it sets a new standard for compactness, and yet so big electrically that it successfully handles four times its maximum horsepower rating on 550 volts. It has no trouble-making bearings, flexible shunts, noisy clappers, bulky arc barriers, slate or molded panels, concealed wiring, and other clapper switch relics.

HERE IS THE TRULY MODERN STARTER!

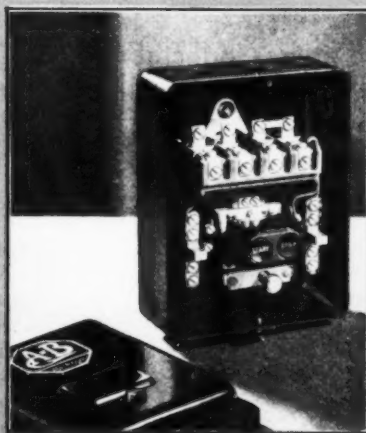
The new 709 gives you sales advantages for new industrial wiring jobs. Know more about this pace setter and its distinct advantages. Send for Bulletin 709. Use the handy coupon.

ALLEN-BRADLEY

BULLETIN 709

**SOLENOID-OPERATED
ACROSS-THE-LINE
A. C. STARTING SWITCH
POLYPHASE RATINGS**

3 H. P. - - 110 Volts
5 H. P. - - 220 Volts
7½ H. P., 440-550 Volts



The Bulletin 709 Starting Switch comes in three forms: 1—with push buttons; 2—without push buttons; 3—with a two-way switch for hand and automatic control. The cabinets are decidedly attractive and allow generous space for all wiring.



SELLS MORE WIRING JOBS

ALLEN-BRADLEY COMPANY,

1307 S. First St., Milwaukee, Wis.

☐ Please mail Bulletin 709.

☐ Please have A-B Sales Engineer demonstrate Bulletin 709 Starter.

Name.....

Address.....

THE MOTOR STARTER

THAT

A GREAT STORY-Mr. Contractor

Did you get your copy?



Why gamble with cheap—secondary switches and receptacles—when you can install real specification wiring devices for **LESS MONEY?**

Study the wiring layouts—facts and figures in the above folder. They were compiled from an actual installation.

Show your building contractor plan No. 3.

Tell him about the night light—the switch and receptacle combinations—the Triplex and radio outlets.

They will put more salability into the speculative home.

Explain to him that the trend today is toward **QUALITY, COMFORT, and CONVENIENCE.**

You, Mr. Contractor, will give all three—and make a greater profit, when you install the

P&S-DESPARD LINE

PASS & SEYMOUR, INC.

Solvay Station

Syracuse, N. Y.

(Continued from page 24)

Chapters within these states: Virginia, Tennessee, North Carolina, South Carolina, Georgia, Alabama and Mississippi, to be known as the Southeastern Industrial Chapter. D. B. Clayton, 844 Martin Building, Birmingham, Ala., president. R. M. Walker, 526 Means Street, Atlanta, Ga., secretary.

N. E. C. A. JOINS CONSTRUCTION LEAGUE OF U. S.

Convinced that cooperation of its several branches is highly essential to lead the construction industry to recovery, the N. E. C. A. has accepted the invitation of the Construction League of the United States to join that organization.

The basic code for the construction industry was submitted by the League, and the N. E. C. A. submitted the supplemental code for the electrical contracting industry as a branch of the construction industry.

At the public hearing on the basic code Malcolm Muir, assistant deputy administrator under General Johnson, called the construction industry "the second largest, but one of the most disorganized." It is felt that the organized front the industry will be able to present through the League and its constituent members will enable a much more speedy return to normal times. One of the League's chief objectives is to strengthen and benefit the whole construction industry by furnishing an agency to work out intra-industry problems.

Other members of the League are: The American Institute of Architects, American Institute of Steel Construction, American Road Builders Association, American Society of Civil Engineers, The Associated General Contractors of America, Contracting Plasterers' International Association, International Cut Stone Contractors' and Quarrymen's Association, International Society of Master Painters and Decorators, National Association of Marble Dealers, National Association of Master Plumbers of the United States, National Committee of Building Congresses, Portland Cement Association, The Producers' Council, Roofing and Sheet Metal Industries Conference, Mason Contractors Association of the United States and Canada, and the Heating, Piping and Air Conditioning Contractors National Association.

NEW MEMBERS

The following applicants have been accepted into the N.E. C.A. since the publication of the list in the September issue:

ALABAMA <i>Mobile:</i> Nick-Klip Elec'l Contr. Co. John O'Donnell Elec. Shop Sigler Elec. Co. Victory Elec. Co.	<i>Augusta:</i> Young Elec. Works <i>Columbus:</i> Georgia Elec. & Constr. Co.	<i>Troy:</i> Barnum Bros. Co. DeVoe Elec. Co. Lafferty Elec. Co.	TEXAS <i>Brownsville:</i> R. W. Pitts <i>Fort Worth:</i> Arlington Heights Elec. Empire Elec. Co. Hensley Elec. Co. State Elec. Co. Turner Elec. Co. Witty Elec. Co.
<i>Montgomery:</i> Cox-Smith Elec. Co. Reeves Elec. Co. Powell Elec. Co.	ILLINOIS <i>Chicago:</i> Crescent Engrg. Co. <i>Freeport:</i> Apex Elec'l Eng. Co.	<i>Utica:</i> Mather, Evans & Diehl Co., Inc. <i>Watertown:</i> Engesser Elec. Mfg. Co., Inc.	<i>Galveston:</i> Elec. Supply Co., Inc. Home Elec. Shop A. E. Kirk Southern Elec'l Sport. Goods
ARIZONA <i>N. Little Rock:</i> Elec'l Constr. Co. Nabholz Bros. N. Little Rock Elec. Co. Wright Elec. Co.	<i>Rockford:</i> Black Hawk Elec. Co. Broadway Elec. Co. The Swords Co. Welden Elec. Co. <i>Springfield:</i> Clyde Kavanaugh	<i>White Plains:</i> Sterling Elec. Co., Inc. NORTH CAROLINA <i>Wadesboro:</i> C. W. McInnis	<i>Mission:</i> Richard Elec. Co.
CALIFORNIA <i>Los Angeles:</i> Stone Elec. Supply Co. <i>San Francisco:</i> W. B. Baker & Co. Frank J. Goodman Chas. A. Soneger	INDIANA <i>South Bend:</i> Brehmer Elec. Co. Campbell Elec. Shop Colip Bros. Inc. MacGregor Elec. Ser. Co. Main Elec. Co. South Side Elec. Co.	OHIO <i>Cincinnati:</i> The Dingle-Clark Co. Meier Elec. Co. The Standish Elec. Co. <i>Dayton:</i> F. S. Breidenbach	<i>San Antonio:</i> Fred Krusch Elec. Co. F. A. Menger Elec. Co. Mintel Elec. Sales Co. Edward Teng
CONNECTICUT <i>Hartford:</i> The Baldwin Steward Elec. Co. Bauer & Co., Inc. Wm. F. Bippus Elec. Co. Fred S. Booma, Inc. The Curtis Elec. Co. Griffing Scofield Elec. Co. Hall Elec. Co. Haselton Elec. Co. Perry Elec. Co. The House Elec. Co. <i>W. Hartford:</i> Samuel K. Lavery Frank N. Treat <i>E. Hartford:</i> L. H. Hale Co.	IOWA <i>Muscatine:</i> Elfers Elec. Store KANSAS <i>Wichita:</i> Industrial Elec. Co. Shelley Elec. Co.	<i>Portsmouth:</i> Wm. J. Licht <i>Toledo:</i> Arnold E. DeFrance Ed. DeLisle Elec. Co. Ted Donohoe Lighting Studio, Inc. Overmeyer Elec. Co. Preter Elec. Co. Toledo Elec. Contractors Assn.	UTAH <i>Salt Lake City:</i> Service Elec. Co.
FLORIDA <i>Ft. Pierce:</i> Bassett Elec. Shop Hayes Elec. Shop C. E. James Parker Elec. Co. Wilson Elec. Co.	KENTUCKY <i>Louisville:</i> Bland Elec. Co. Elec. Constr. Co. Metz Elec. Co. Schill Elec. Co. Southern Elec. Co.	OKLAHOMA <i>Tulsa:</i> Circle L. Elec. Co.	VIRGINIA <i>Alexandria:</i> J. Kent White <i>Roanoke:</i> Rakes Elec. Co.
<i>Jacksonville:</i> Acme Elec. Co. Arnau, G. C. Southern Elec. Co. C. I. Woodruff	LOUISIANA <i>New Orleans:</i> F. J. Bellott Industrial Armature Wks. Inc. Levy & Gonsenheim, Inc. Reliance Elec. Works Upper City Elec'l Works Universal Elec. Constr. Co.	OREGON <i>Portland:</i> Bressie Elec. Co-operative Elec. Co. F. W. Friberg W. R. Grasle Co. Leo M. Greiner P. G. Strom	WASHINGTON <i>Bremerton:</i> Fred W. Fein Co., Inc. <i>Wenatchee:</i> A. J. Gehlman Gray Elec. Shop Pounder Elec. Co. John M. Omens P. D. Winter Elec. Co. Wright Elec. Co.
<i>Melbourne:</i> Melbourne Elec. Co. <i>Stuart:</i> Rodeo Elec. Corp. St. Lucie Elec. Shop	MASSACHUSETTS <i>Haverhill:</i> Heath Elec. Inc. <i>Lynn:</i> Des Roberts Elec'l Co.	PENNSYLVANIA <i>Erie:</i> Acme Elec. Shop Delmer Elec. Co. Erie Elec. Sales & Ser., Inc. Garvin Bros. Elec. Co. Northwest Elec. Constr. Co. Rusterhoitz Wall Paper & Paints, Inc. M. B. Schutte Elec. Ben Yapple Elec. Co.	WISCONSIN <i>Burlington:</i> Rewald Elec. Co. <i>Chippewa Falls:</i> Holtz Bros. Elec. Co. <i>Green Bay:</i> Kehl Elec. Co. <i>Kenosha:</i> Harry Herrema Elec. Shop
<i>Tampa:</i> W. L. Lightsey McWilliams Elec. Co. Vigo Elec. Co.	MISSOURI <i>Kansas City:</i> G. V. Dameron Elec. Co. W. L. Hutchinson Elec. Co.	<i>Philadelphia:</i> Acme Elec. Co. Atlas Elec. Co. Cummings Elec. Co. Jos. T. Fewkes & Co. Elec. Apparatus Rep. Co. Elec. Refrigeration Mot. Electro Constr. Co. Charles Kester Mueller Elec. Co. Chas. E. Tull Co.	<i>Lake Geneva:</i> McClellan and Sherman <i>Madison:</i> Loprich-Schaub Elec. Shop Wisconsin Foundry & Machine Co.
<i>Titusville:</i> O'Flanagan Elec. Co. <i>Vero Beach:</i> Connelly Elec. Shop Radinsky Elec. Shop	NEW JERSEY <i>Newark:</i> Jaehrig, Paul H., Inc. Motor Sales & Eng. Co., Inc.	TENNESSEE <i>Chattanooga:</i> F. P. Sweet W. C. Teas Co.	<i>Marshfield:</i> Merkel Elec. Co. <i>Milwaukee:</i> Phil Duffy, Inc. Geo. Poehlmann & Son Co.
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\\ code chats //

A MONTHLY DISCUSSION OF WIRING PRACTICE AND QUESTIONS OF INTERPRETATION, PRESENTED WITH A VIEW TOWARD ENCOURAGING A BETTER UNDERSTANDING OF THE NATIONAL ELECTRICAL CODE

CONDUCTED BY F. N. M. SQUIRES
ASSISTANT CHIEF INSPECTOR, N. Y. BOARD OF FIRE UNDERWRITERS

SUPPORTING BOXES ON LATH

703-d. *Wood or metal lath or composition shall not be used as a support for outlet boxes. How shall the boxes be secured on the ceiling of an old building?*

Rule 703-d, as mentioned in the first sentence, pertains to new work. This rule covers the requirements for securing boxes on new work and says that lath is not to be considered as a structural unit of a building.

But on a finished house job where the plaster cannot be cut back to the beams, and the floor above cannot be opened to put in the metal supports or wood strip, it is common practice to cut away the plaster and then to secure the boxes to wooden cross strips, slipped in above the lath, by means of screws running up through the lath into the cross strips. Also, toggle bolts having long cross members so as to bear across three or four laths are used. In all cases the boxes shall be rigidly secured in place.

WIRES IN WIREWAYS.

511-f (2) *The sum of the cross-sectional areas of all contained conductors shall not exceed 20 per cent of the interior cross-sectional area of the wireway. How is this figured?*

This is figured from the actual dimensions of the wire measured over conductor, insulation and braid. While in the table of 612 the diameters of some wires are given and in 602-c is specified the thickness of rubber insulation, there is no information in the Code as to the thickness of the braid over the rubber insulation. Therefore, the desired information cannot always be ob-

tained from the Code; but, of course, can be by actual measurements.

Many inspection departments have tables giving overall diameters and cross sectional areas but various tables of these show different values according to small differences in the thicknesses of the rubber and of the braid. A table of average areas would be of great help.

WIRES OF DIFFERENT SYSTEMS NOT TO BE IN SAME RACEWAY

What is meant in 506-o by "wires or interior wiring systems not electrically connected to each other within the building shall not be contained within the same raceway"?

This rule corresponds to rule 503-n for conduit work. It simply means that wires of different systems shall not be installed within the same underfloor raceway. In other words, bell, telephone, or other low tension wires shall not be placed in the same raceway with wires for light, heat or power. Also wires of a.c. circuits shall be kept separate from d.c. circuits.

OUTSIDE DRAIN PITS AT FILLING STATIONS

Is it necessary to install explosion resisting fittings in an open oil drain pit located outside without a roof? Would it be permissible to install other than explosion resisting fittings if roof was over same, with ends and side left open; or if any of the sides were enclosed? If regular fittings may be used may they be installed less than 4 ft. from floor of pit?

In fair dry weather with some air

stirring, probably the average drain pit is safe enough. But on a damp dead day, as is often experienced, the atmosphere in such a pit may become very dangerous. The oil people tell us that most crankcase oil contains a fair supply of gasoline. Then again many cars which are drained over the pits, leak considerable gasoline. Therefore, the fumes lying in a pit may be sufficient to place the pit in Class 1 location. This would be regardless of whether the pit is roofed over or enclosed by wall or not.

HOW TO OBTAIN OFFICIAL INTERPRETATIONS

To what individual and at what address, should questions, regarding interpretation of the National Electric Code, be addressed? I am not speaking of questions as answered by Mr. Squires in your "Code Chats," where he has only authority in his territory and his answers are only his opinion, when given outside his jurisdiction as inspector.

I want to reach the person or persons formulating the Code, in order to settle differences of opinion on interpretation of the Code.

Our correspondent has stated exactly the status of the Code Chats. We concur in his understanding.

Official interpretations of rules of the National Electric Code can be obtained by submitting the question to A. R. Small, chairman of the Electrical Committee, N.F.P.A., 109 Leonard Street, New York City.

In requesting interpretations the following procedure must be adhered to:

"Those desiring an interpretation

Electrical Contracting, October, 1933

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NON-METALLIC SHEATHED CABLE

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Cables Provide Profit
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Economy!*

Light in weight.

Easy to lug and lift.

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WHAT you SAVE in time alone will net you a substantial margin. ROMEX speeds up roughing in—and on finished house work cuts time even more per outlet.... Recommend ROMEX to architect and owner, and bid in the work at a profit. Your supply house carries it in stock.



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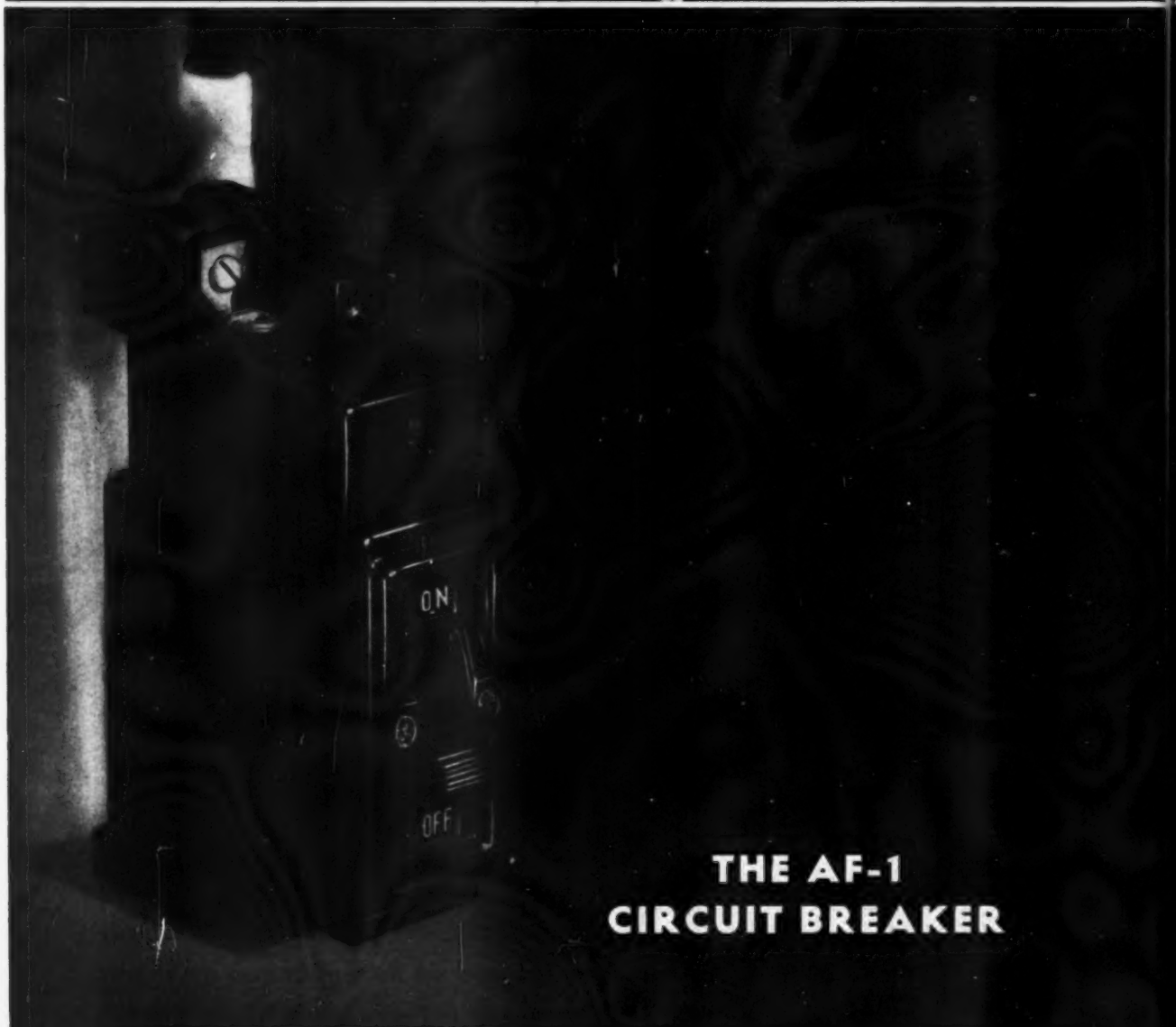
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Fuseless, Tamper-



THE AF-1 CIRCUIT BREAKER

Illustrations (above and on opposite page) show single-pole and triple-pole breakers, 15- to 50-amp. size; height of each, 6 inches

Mail the coupon now—to the nearest G-E office, or to General Electric, Dept. 6A-201, Schenectady, N. Y.

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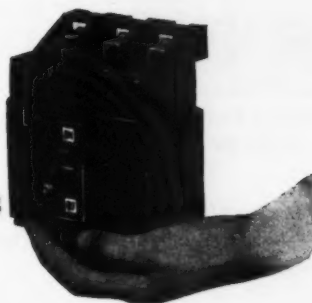
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490-17

proof Protection

for building and industrial circuits

*Small in size
Mighty in action*



THE AF-1 is a modern substitute for fuses and fused switches in panelboards, load centers, and service entrances, and in dead-front switchboards; also for individual circuits and appliances.

UNIQUE IN PRINCIPLE

An exclusive feature of the AF-1 is an entirely new method of arc interruption for circuit breakers. The contacts are in a closed metal chamber, which effectively confines the arc when the breaker opens. Thus confined, the arc is broken under pressure in .008 of a second—remarkably high-speed operation. There is no external arc. *Except for the click of the mechanism when the breaker opens automatically, you would not know it had operated.*

TAMPER-PROOF

A sealed Textolite cover encloses all operating parts except the handle. The overload trip point cannot be changed. Thus, the AF-1 does away with the all-too-common "bridging" and overfusing.

ELIMINATES INCONVENIENCE

Service can be restored easily and quickly, as there are no fuses to look for and replace. A target shows which breaker in a group has tripped. A slight movement of the handle recloses it.

ASSURES SAFETY

Even a child can safely operate the AF-1. When properly installed, no live parts are exposed. There is no external arc, because the contacts are in a closed chamber.

OVERLOAD PROTECTION

Bimetallic thermal strips deflect on overload and actuate the trip mechanism to open the breaker. On breakers rated over 50 amperes there is, in addition, an instantaneous magnetic trip for short-circuit protection. The breaker cannot be held closed on overload—the trip mechanism operates free from the handle.

QUICK MAKE-AND-BREAK

No matter how slowly the handle is operated, the contacts make-and-break with a snap, by means of an over-center spring mechanism.

RATINGS

Up to 600 volts, alternating current, and 250 volts, direct current; 15 to 600 amperes; single-, double-, and triple-pole. The 50-amp. size has an interrupting rating of 5000 amp.; the larger sizes, 10,000 amp.

Thorough tests have proved the sturdy construction of the AF-1, and its ability to perform in accordance with its rating—with liberal safety factors. It has been built to last for a long time.

GENERAL ELECTRIC

Good Profits Quick Profits CAN BE MADE NOW



The new Exide-Keepalite Emergency Lighting System is a 2-way profit maker that you have been hoping for.

Why Keepalite? Because, despite every precaution of utility companies, they cannot prevent service interruptions due to storms, street accidents and troubles within the premises. These lighting failures occur more frequently than is commonly supposed. Imagine the danger that could easily occur in a crowded theatre, school auditorium or hospital operating room if lights suddenly go out! Injury, serious damage, loss of good will. That is why *Exide-Keepalite* can be easily sold to such places in your community.

The Market for Keepalite at its unusually low price is almost

without limit! This is demonstrated by the fact that thousands of larger Exide Emergency Lighting Battery Systems—costing 5 to 25 times as much as Keepalite—have already been sold throughout the country.

Keepalite fills a definite need in every community. Emergency Lighting protection is needed regardless of the times. Keepalite can be sold now!

FREE

Booklet fully describing Keepalite: Why Keepalite; What It Is; Where Needed and HOW TO SELL IT. Clip, sign and mail this coupon today. It leads the way to bigger 1933 profits.

Keepalite Prospects

Hospitals
Schools
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Banks
Engine Rooms
Stores & Markets
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Restaurants
Apartments
Hotels
Institutions
Jails, etc., etc.

MAIL THIS COUPON TODAY

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19th & Allegheny Avenue,
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Please send me your FREE Contractor's Booklet describing Keepalite—the NEW 2-Way profit maker.

Name.....

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THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia

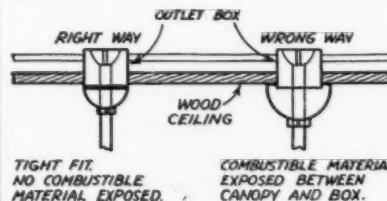
The World's Largest Manufacturers of Storage Batteries for Every Purpose
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shall supply the chairman with five identical copies of a statement in which shall appear specific reference to a single problem, paragraph, or section of the Code. Such a statement shall be on the business stationery of the inquirer and shall be duly signed."

It is expected that when queries involve actual situation they will so state and that all parties concerned will be named.

METAL TO METAL FIT FOR FIXTURE CANOPY

703-a requires that when a fixture canopy is used in place of a cover and the wall or ceiling finish is of combustible material a continuous metal to metal or equivalent fit shall be secured between the edge of the box and the canopy. Could you make a sketch showing how it should be done?



TIGHT FIT.
NO COMBUSTIBLE
MATERIAL EXPOSED.

COMBUSTIBLE MATERIAL
EXPOSED BETWEEN
CANOPY AND BOX.

This merely means that the diameter of the canopy at the box be the same as that of the box or that there shall be a tight "metal to metal" fit between the box and the canopy in order that there be no part of the combustible wall or finish exposed to any flames which may start in the box or canopy.

FLUID SOLDER

I would like to have your opinion as to whether a patented fluid solder is acceptable to use in making splices on wiring systems.

Tests made on splices made up with many forms of fluid solder have shown very unsatisfactory results. In many cases the so-called solder proved to be a fairly good insulator. In others, acids present had a very deleterious effect on the copper wires.

Conditions arising from the use of this kind of solder have proven so bad that the 1933 Code will require that splices be "soldered with a fusible metal or alloy unless made with a splicing device."

This rule will thus prohibit the use of the fluid solders.

**Check THE COST
OF OBSOLETE CIRCUIT PROTECTION
IN YOUR PLANT**

ACTUAL investigations have proved that the total cost of the replacement of blown fuses and the resulting time wasted by idle men and machines, runs into the profits of thousands of dollars annually. This cost represents unnecessary waste!

The Westinghouse Nofuze Circuit Breaker eliminates fuses in the protection of lighting and power circuits in industrial plants.

With this breaker, anyone can restore power instantly and safely after a short circuit or heavy overload has interrupted service. There is nothing to replace or renew. Practically no time is lost.

End Fuse Waste!

There is only one method to accurately determine your present circuit-protection cost. Keep a record of every blown fuse and evaluate the lost time of men and machines. You will be amazed at what fuse protection costs you yearly.

Send for free copies of the Fuse Check Book which makes it easy to keep such a record. Check this leak in profits for yourself! You'll find that an investment in fuseless circuit protection pays immediate dividends.

Just mail the coupon today for a free copy.

SEND FOR CHECK BOOK

Westinghouse Electric & Manufacturing Company
Room 2-N—East Pittsburgh, Pa.
Enclosure: I would like to investigate the Fuse Check Book and a copy of the booklet on low-cost wiring.

Name

Company

Position

Address

Westinghouse
Quality workmanship
guarantees every Westinghouse product



This check book makes it easy to keep an accurate record of lost time and money caused by blown fuses in your plant.

The Westinghouse Nofuze Breaker which eliminates fuses in the protection of plant wiring circuits. Available also up to 600 amperes, 600 volt a-c, and 1000 volt d-c.

A typical advertisement of the Westinghouse National Advertising Campaign on Nofuze Industrial Circuit Breakers.

**ARE YOUR
CUSTOMERS
checking
BLOWN-FUSE
COSTS?**

YOUR customers . . . Industrial Plant Managements right in your community . . . are learning of the great money-saving advantages of Westinghouse Nofuze Circuit Breakers through a carefully-planned series of national advertisements, of which the above is typical.

They are being urged to get the Westinghouse Fuse Check Books which make it a simple matter to check the huge waste in lost time for men and machines that results from blown

fuses . . . to prove to their own satisfaction that Nofuze Breakers soon pay for themselves.

Don't pass up this opportunity to win new business! See to it that your customers use these check books. It means circuit-breaker sales and new wiring jobs for you.

Send the coupon today for a supply of check books and the new booklet giving complete information on Nofuze Breakers.

SEND FOR INFORMATION

Westinghouse Electric & Manufacturing Company
Room 2-N—East Pittsburgh, Pa.

Gentlemen: I am interested in your new plan for selling Nofuze Industrial Circuit Breakers. Please send complete information.

Name

Company

Position

Address

Westinghouse

Quality workmanship
guarantees every Westinghouse product



CONTRACTING news

INFORMATION OF INTEREST TO ELECTRICAL CONTRACTORS
CONSISTING OF ITEMS OF NEWS, SHORT ARTICLES, PRACTICAL
IDEAS, ETC., OUR READERS ARE INVITED TO CONTRIBUTE TO
THIS DEPARTMENT

CONTRACTORS N. R. A. CODE HEARING COMPLETED

The code of fair competition for the electrical contracting industry was given its final public hearing in Washington on September 7, before Deputy Pirnie. This was one of a number of codes of different divisions of the construction industry hearings which were not completed until a week later. Because of the many conflicts and resulting confusion which first has to be removed no codes in the construction industry have been approved prior to going to press.

The electrical contractors' code was presented by L. E. Mayer, president of the National Electrical Contractors Association.

The National Association of Manufacturers objected to the definitions of "employee" and "electrical worker" claiming that these included the regulation of the work of the factory electrician and maintenance man. This association asked that such employees be particularly removed from the contractors' code.

The telephone interests likewise requested that the regulations except the work of employees of telephone companies engaged in the installation of company equipment.

A brief was presented by a representative of the International Brotherhood of Electrical Workers claiming the right to act for the contractors and requesting that in setting up the National Code Authority three members shall be contractors, three members named by the Union and one each named by Secretaries of Labor, Interior and Agriculture.

Labor also crossed swords with the contractors in the matter of

wages and hours. A 30-hour week was suggested with minimum wages as follows:

Southern zone: Skilled labor, \$1.00 per hour; unskilled, 40 cents.

Central zone: Skilled labor, \$1.10 per hour; unskilled, 45 cents.

Northern zone: Skilled labor, \$1.20 per hour; unskilled, 50 cents.

At the conclusion of the hearing two additional paragraphs were added to the Code by the National Electrical Contractors Association to take care of the many complaints from members regarding wholesaling houses which have contracting departments:

(a) The Electrical Contracting Industry recognizes that the most economical method of distribution in the interests of both the consumer and the industry is from manufacturer to wholesaler to contractor. Therefore, provisional upon the adoption of a reciprocal system by recognized wholesalers, the contractors agree to purchase all of their electrical products from recognized wholesalers, where the products required are available from such recognized wholesalers.

(b) It is the firm belief of the members of this Industry that the wholesale and contracting divisions of the electrical industry constitute a separate business. In the event, however, that the same capital is employed for both a wholesale and a contracting business, then the contracting branch of such business shall be conducted separately, with an individual system of accounting in accordance with the code for the Electrical Contracting Industry. Further, it shall be unfair competition for the contracting branch of a business operating both wholesale and contracting departments to charge the consuming public prices that would be lower than prices charged by contractors under the provisions of this code.

The members of the Code Committee, N. E. C. A., who attended the hearing were as follows: L. E.

Mayer, Chicago, chairman, president; E. N. Peak, Marshalltown, Ia., vice-president; J. A. Fowler, Memphis, Tenn., executive committee, N. E. C. A.; D. B. Clayton, Birmingham, Ala., executive committee; J. R. Stolzenbach, Baltimore, Md., national chairman, National Motor Section, N. E. C. A., and L. W. Davis, general manager, N. E. C. A.

ANALYSIS OF 1933 CODE CHANGES

The National Electrical Manufacturers Association, through its uniform ordinance department, has again made available to the industry an analysis of the changes to be found in the new edition of the National Electrical Code. The book, which is the work of Arthur L. Abbott, follows the same general plan of previous analyses.

In announcing the new edition, H. B. Kirkland, director of the department, stated that the purpose of the analysis is to speed up the assimilation of the changes by all users of the Code and thus to further the early adoption of the new standards.

Approximately 15,000 copies of the previous edition were distributed and it is expected that the current edition will at least equal that number.

INSPECTORS HOLD FIRST NATIONAL CONVENTION

For the first time in its five years of existence the International Association of Electrical Inspectors on September 11 to 15 at the Congress Hotel, Chicago, Ill., brought together its different sections into one national convention.

Previously the several sections have held their own annual convention and at times two or more sections have held joint meetings but this was the first time that all were represented at one time.

The registration, which exceeded five hundred, showed the interest that attached to the meeting which not only drew inspectors but other electrical men from all parts of the country and Canada.

Instead of a program devoted to code subjects as is the practice at inspectors' meetings, the convention had an industry flavor, days being set apart for the manufacturers and wholesalers, the utilities and the leagues and the contractors. In fact,



A
STEELTUBES
INSTALLATION
Medical Arts
Building
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● Architects: Erickson & Co., Duluth, Minn. Associate Architect: Ellerbe & Co., St. Paul, Minn. Engineer: Chas. Foster, Duluth, Minn. General Contractor: Paul Steenberg Construction Co., St. Paul, Minn. Electrical Contractor: Commercial Electric Co., St. Paul, Minn.

They're Proud of this Job

More than 70,000 feet of Steeltubes protects the electrical circuits of the new Medical Arts Building, Duluth, Minnesota. The owners, the architects, the engineers and the contractors—all are proud of this installation. And rightfully so, because Steeltubes represents the finest electrical and mechanical protection for wiring that money can buy.

Steeltubes is distinctive in many ways. It is electrically welded steel tubing, electro galvanized outside and with baked on enamel inside. It requires no threading, consequently is of uniform thickness for any given size throughout the entire length of the circuit. Three simple fittings adapt it to any installation. It cuts easily, bends easily and can be straightened and re-bent



without loss. It eliminates much of the back-breaking labor incident to the use of old-style threaded conduit, and permits faster construction. It results in a convincing workmanlike job the first time you use it—and every time you use it.

If you will indicate your interest in this modern threadless rigid conduit we will gladly send full information and a sample joint. Three minutes after you receive the sample you will understand why more than 40,000,000 feet of Steeltubes has been placed in service. Write today.

Electrical Division
STEEL AND TUBES, INC.
 WORLD'S LARGEST PRODUCER OF ELECTRICALLY WELDED TUBING
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threaded for FAST FITTING

● Speed in fitting means quicker installation time—means greater satisfaction and savings in time and money to everyone concerned with the job. ● That's why Fretz-Moon Conduit and Couplings are threaded by precision threading machines that cut a deep, sharp, true thread free from rough spots and burrs—a thread that starts easily and runs free and fast to a tight fit. ● Short lengths, cut to fit on the job, are easily threaded, because Fretz-Moon Conduit—the only conduit made by the "continuous process"—is free from "burnt" or hard spots in the metal that cause threading trouble. ● Fretz-Moon Conduit is available in all standard sizes and in three finishes that meet all conditions of service.

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**Rigid
conduit**



the subject of the meeting might well have been, "What can the electrical inspector do to promote the best interests of the electrical industry?"

From the papers and the discussion certain things stood out. The inspectors learned that no matter what their own personal viewpoint might be, the electrical industry expects them to take a greater interest in the affairs of the industry.

The inspectors were urged to educate the public on matters of electrical safety and ordinances as the one part of the industry that had no commercial attachment.

Reinspection was urged by many of the speakers as well as control of bootlegging. It was manifest that both of these subjects were in the forefront of the thinking of the industry.

Adequacy of wiring was also urged in a number of addresses, it being pointed out that more adequate wiring was both an economy to the public in the long run as well as matter of public safety, particularly as the art advances and more demands are made on electric service.

The electrical industry appeared to be unanimous on its problems with one exception. The utility interests asked for greater simplification of the National Electrical Code while those who had in mind the practical application of the Code were suggesting that each year was bringing new problems that needed more rules.

The addresses which were delivered at the convention were as follows:

Safety Day: "Purpose of the Meeting," J. C. Forsyth; "Five Years of I. A. E. I. Progress," N. E. Canady; "The Fire Loss Reduced by Intelligent Inspections," George H. Parker; "The Idea of Progress," Franklin H. Wentworth; "How Can the Inspector Most Effectively Use the Work of Underwriters' Laboratories," Dana Pierce; "The Authority Enforcing the Code," A. R. Small.

Electrical Manufacturers, Wholesalers and Dealers Day: "The Manufacturers' Interest in an Intelligent Enforcement of the Code," J. S. Tritle; "The Advantages of a Uniform Interpretation of the Code," S. L. Nicholson; "The Uniform Electrical Ordinance," Harry B. Kirkland; "Why the Property Owner Should Appreciate the Electrical Inspector and His Work," H. B. Crouse; "The

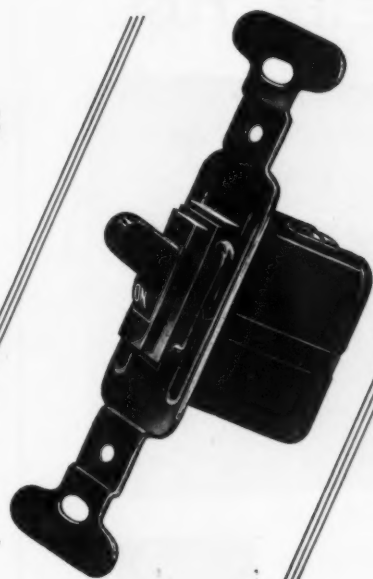
H&H T-S TIME SAVER

NEW TS LINE OF SWITCHES

Fits all
Standard Plates

Twice
as much room
for quick wiring

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for Type "C"
Lamp Loads

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All Bakelite Base
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Single and Combination Switches

Ready wired in One Unit



No. TS-11
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TS stands for a line of competitively priced switches designed specifically for modern Type C Lamp loads and enclosed in compact Bakelite bases. "TS" Switches are STANDARD—fitting standard switch boxes and standard Bakelite or brass switch plates. The Type C mechanism is fully enclosed and sealed—making a dust-proof switch. The compactness of the base affords twice as much wiring room as other standard switches of their price and rated capacity. In addition, new READY WIRED combinations of TS Switches at competitive prices are supplied in any two or three lever arrangement. They come to you made up in one base, ready for installation, with ample wiring room. Write for catalog data-sheet with complete listings for ordering.



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SAFETY SWITCHES

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ACCESSIBLE FUSES WIRING SEQUENCE

SWITCH - METER - FUSE



No. 1038
30 Amp.—2 Pole—1 Fuse
Solid Neutral—125 Volt
Sequence
Switch—Meter—Fuse



No. 1039
30 Amp.—3 Pole—2 Fuse
Solid Neutral—125-250 V
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Switch—Meter—Fuse

Send for Catalog and List of Switches
Approved by your Light Company

**METROPOLITAN
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1250 ATLANTIC AVENUE
BROOKLYN • NEW YORK

Electrical Inspector and the Wholesaler," Herbert Metz.

Utilities and Electric League Day: Address of Welcome, E. W. Lloyd; "The Inspectors and the Central Stations," Bernard F. Weadock; "The Electrical Inspector's Service to the Public," William A. Jackson; "Saving Dollars by Wiring Sense," E. A. Brand; "Complete Cooperation," J. J. Caddigan.

Electrical Contractors Day: Address of Welcome, William McGuineas; "Inspection Essential to Electrical Contractor's Progress," L. E. Mayer; "Report of I. A. E. I. Committee on Investigation of Fires and Accidents," W. E. Bostwick; "The Larger Opportunity of the Inspector," S. B. Williams; "A Resume of the Meeting," John E. Wise.

MINNESOTA CONTRACTORS ORGANIZE

The several local contractors' associations in Minnesota have organized into the Minnesota Electrical Council with offices at Minneapolis. William A. Ritt is secretary-manager devoting his full time to the work. The other officers are F. T. Langford, president; D. Ehlert, vice-president; F. M. Tripp, treasurer.

A cost finding committee has been at work for more than a month. Commodity prices are being checked so as to keep the membership informed. A bulletin service has been started.

Regular meetings are being held by local chapters throughout the state and it is expected that the state will be 100 percent organized in a few weeks.

BERRIEN COUNTY, MICH., ASSOCIATION REELECTS OFFICERS

At the annual meeting of the Electrical Contractors Association of Berrien County, Mich., held on September 5 at Niles, Mich., Frank Hallman of Benton Harbor was reelected president and Leslie L. Potts, also of Benton Harbor, reelected secretary-treasurer. Ward Young of Bridgeman was elected vice-president.

The proposed N. R. A. code was presented at the meeting and upon approval by the government will receive full support from all members of the association.

One of the major activities of the association during the past year was

A TAPE FOR EVERY PURPOSE



HERE is rubber tape that insulates and sticks . . . Friction tape that strips without raveling and holds forever . . . made by the world's largest manufacturer of Industrial Rubber Goods.

Most of the better suppliers handle these tapes. If your supplier cannot fill your order, won't you send us his name, or phone the "U. S." Branch nearest you, so we can take steps to assure you of prompt service in the future.

United States Rubber Company

1790 BROADWAY  NEW YORK CITY

Stocks in all Industrial Centers

FRINK ILLUMINATION



Central National Tower, Battle Creek, Mich.
Holabird & Root, Architects.

MODERN BANK ILLUMINATION

This unretouched photograph shows perfect illumination without glare or spotting.

The large banking room is illuminated in the modern manner—extruded metal ceiling strips supplemented by illuminated balcony fronts. Complete details on request.

THE FRINK CORPORATION
23-10 BRIDGE PLAZA SOUTH
Long Island City, N. Y.

cooperation with the state fire marshall's office in promoting better standards of electrical installations. Other activities engaged in were the sponsoring of county and state electrical inspection, and the support of two Bills in the state legislature for state electrical inspection.

A new association was organized by Leslie L. Potts at Port Huron, Mich., during the past year.

HOME WIRING SUGGESTIONS

The St. Louis Electric & Radio Association is sending out this year a series of home wiring suggestions to a list of local architects, builders and contractors actively interested in residential construction. The series will take up one suggestion at a time. The latest suggestion covered rear entrance and backyard lighting.

DAMERON TO HEAD RETAIL AND WHOLESALE DIVISION NRA

Dr. Kenneth Dameron, Assistant Professor of Marketing of Ohio State University, has been appointed head of the Retail and Wholesale Division of the National Recovery Administration.

Dr. Dameron was executive secretary of the Electrical Merchandising Joint Committee which produced the report entitled "Merchandising Electrical Appliances."

PUBLICATION ON ELECTRICAL INSULATING MATERIALS

The American Society for Testing Materials, Philadelphia, Pa., has just published, in book form, the 32 A. S. T. M. specifications and test methods covering electrical insulating materials, called "A. S. T. M. Standards on Electrical Insulating Materials." Included in this book is the 1933 report of Committee D-9 on Electrical Insulating Materials.

Several new test methods and specifications are contained covering flexible varnished tubing, black bias-cut varnished cloth tape, asbestos roving and thickness tests for sheet and tape.

Other widely used A. S. T. M. standards are given relating to electrical porcelain, varnishes, tests for power factor and dielectric constant, laminated sheet materials, pasted mica, friction tape, rubber insulating tape, rubber gloves, and matting, etc.

PORTABLES
that meet every requirement

The eight portable lamp guards pictured here present only a portion of the extensive McGill portable guard line.

McGill Portables designed to meet every imaginable need, bring directed and protected light to every job and every worker.

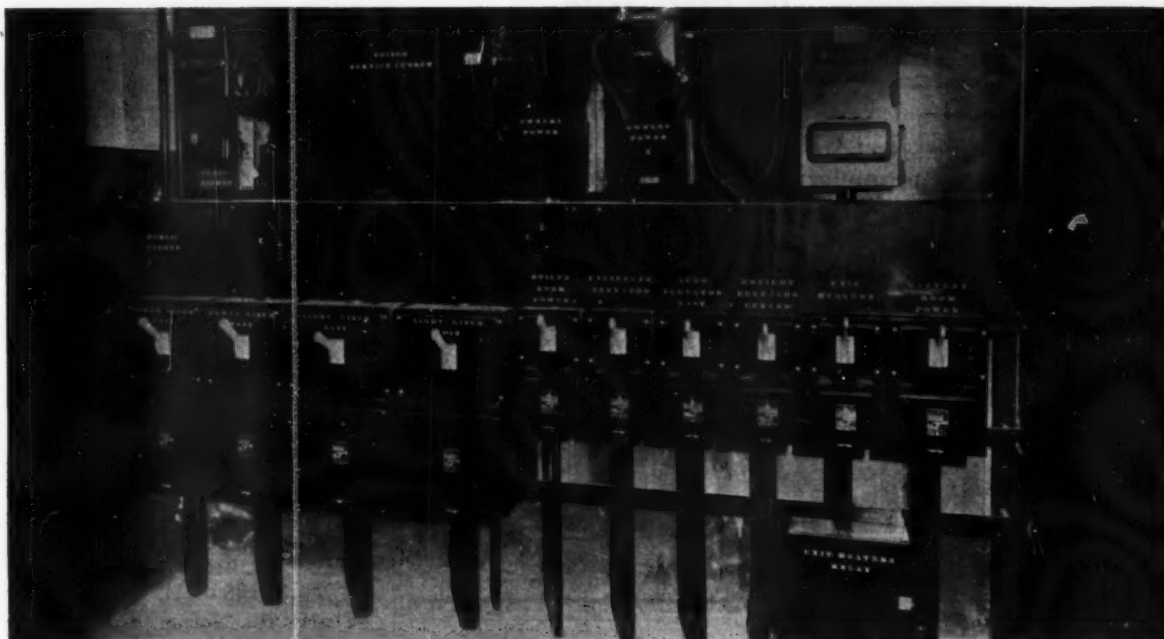
McGill Portables perform a multiple duty; they guard light bulbs against breakage, and guard workers from the danger of serious injury. They protect workers from strain due to improper lighting conditions, and protect your invested dollars against unnecessary losses. . . Write for our interesting catalog describing the entire McGill line of portable lamp guards.

McGILL
MANUFACTURING CO.
Electrical Specialties of Quality
ESTABLISHED 1904
VALPARAISO - INDIANA
Box No. 670

Services:
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Special Services
Quality Pat. Service
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Services:
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Ⓣ "R.B." SWITCHES CHOSEN FOR VARIED CONTROL



[[4-200 amp., 6-60 amp. front operated fusible "R.B." switches and 2 meter]]
service switches comprise this distribution center in a modern building.]

Distribution board space is reduced
by using front operated switches.
In the illustration 10 switches . . .
4-200 amp. and 6-60 amp. are in-
stalled side by side in a space 9
feet 10 inches wide . . . less than
a foot per switch average.

200 amp. circuits
Power riser east.
Power riser west.
Light riser east.
Light riser west.

60 amp. circuits
Boiler room power.
Passenger elevator.
Auto elevator.
Freight elevator.
Unit heaters.
Battery room power.

"R.B." switch features
Break full rated load.
"Vystipe" fuse clamps.
Lower half of cover interlocked
with switch handle. Lift in "off"
position to renew fuses.
Hole in end of handle for stick
operation. Handle lies close to
cover in "on" and "off" positions.
Slots in handle guard for locking
switch in "on" or "off" position.

THE TRUMBULL ELECTRIC MFG. COMPANY

Plainville Conn.



A GENERAL ELECTRIC ORGANIZATION

Wiremold makes it Pay!

*"Better-Light, Better-Sight" Spells
"Opportunity" for Every Wise
Contractor!*

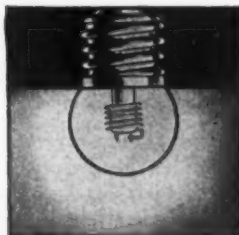
WHY? Because Wiremold makes it easy and practical to modernize and relocate lighting circuits to the best advantage of his customers and himself. He can **SELL** the hesitating prospect by **SHOWING** the economy and wisdom of a Wiremold installation—and then **DO THE JOB** at a profit!

WIREMOLD

HARTFORD, CONN.



For intermittent lighting free from lag NEON GLOW LAMPS



1-Watt
Bulb G 10

A single control board in a large automobile factory carries 180 Neon Glow Lamps as indicators for motors and safety switches. The designer, electricians and operators find these lamps ideal because they are sensitive, long-lived, low in current consumption, cool and glareless. Neon Glow Lamps are available in sizes

from $\frac{1}{4}$ to 3 watts, and a few cents covers the cost of operating any of them continuously for a whole month. For pilots, signals, exit lights, stroboscopes, oscillators and hundreds of other uses. Get the details on the new low prices and their many uses from General Electric Vapor Lamp Company, 867 Adams St., Hoboken, N. J.

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**GENERAL  ELECTRIC
VAPOR LAMP COMPANY
HOBOKEN, N. J.**

Manufacturers News

ROACH NOW CONNECTED WITH APPLETON ELECTRIC

Walter O. Roach, formerly president of the Roach-Appleton Mfg. Co., South Bend, Ind., is now connected with the Appleton Electric Co., Chicago, in the capacity of assistant to the president and in charge of sales.

General Electric Co., Schenectady, N. Y., has published bulletin GEA-1654A superseding GEA-1654, covering type CR7505 photoelectric relays. Illustrations are used throughout the pamphlet showing the features of the relays, applications and diagrams showing typical characteristic curves of relays for various potentiometer settings. A section of the pamphlet is also devoted to accessories for the relays.

C. F. NORTON JOINS THE LOUIS ALLIS CO.

Charles F. Norton, former vice-president and general manager of the Howell Electric Motors Co., Howell, Mich., has joined the Louis Allis Co., Milwaukee, Wis., in an executive capacity.

A broadside on general floodlighting has just been issued by Electric Service Supplies Co., Philadelphia, Pa., which contains illustrations showing the applications of floodlighting to buildings, sports, fountains, filling stations, railroad yards, etc. This broadside has been published at this time in connection with the drive for "Better Light, Better Sight," which the electrical industry is now conducting.

Diamond Chain & Manufacturing Co., Indianapolis, Ind., has just published Catalog 583 covering its line of Diamond chain and sprockets. The catalog of 96 pages contains complete information on where to use roller chains, how to select proper sizes and sprockets, calculation formulae and tables for determining chain length; tables giving complete data on chains of various pitches, single and multiple strand

BEAT THE PRICE APPEAL

with Sollaire Luminaires

"THE total cost of glass and hanger must not exceed \$6, and the unit selected must accommodate a 750-watt lamp," reads the specification—and you must sharpen your pencil and cut the corners on your bid.

Many specifications fail to mention the really important requirements for good lighting: Smart appearance, effective light distribution, high efficiency, low maintenance and correct design.

But if you explain to the purchaser these requirements of good lighting, and show him how the Westinghouse Sollaire fixture meets them all, *you'll win more lighting contracts.* And you can step out of the unprofitable price rut.

The high efficiency of Sollaire fixtures makes it possible to supply the same foot-candle intensity with fewer fixtures . . . or to obtain more light without additional wiring or without increasing the number of fixtures.

Mail the coupon for more information about this low-priced lighting unit which you can sell at a reasonable profit, against price-cutting competition.

**Twilight Zone—
That deceptive half-light between obvious darkness and adequate illumination.*

Westinghouse

Quality workmanship guarantees every Westinghouse product



Use this slogan to identify yourself with the Nation-wide fall lighting campaign of the Edison Electric Institute.

Sollaire Luminaire—
An attractive fixture that is easy to install and maintain.



*TEST FOR THE TWILIGHT ZONE

Make this simple check of your prospect's lighting. Take a phone book and go wherever people work. Open it at random. Does every word stand out sharp and clear? Can you read rapidly without effort? You should be able to do so readily—for the telephone book is designed for perfect legibility under proper light. If you can't—if you have to squint and draw the book closer—the building is in the Twilight Zone and needs better lighting.

SEND FOR INFORMATION

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Room 2-N—East Pittsburgh, Pa.

Gentlemen: Please send information on Sollaire Fixtures for lighting stores and offices.

Name

Company T 79671

Address EC 10-33

UTILITY

Time Switch Model 89

A revelation
in
performance
and value

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WITH
INTERDEPENDENT POWER

NEW in principle
and design

Strictly motor powered; not self-winding. Dependable, accurate, despite current failures or frequency variations.

A HIGH GRADE PRODUCT

Single pole mercury to mercury switch, 30 amperes, 120 volts, A. C.; dust proof, aluminum housing.

Approved by Underwriters' Laboratories

Ask your Jobber or write

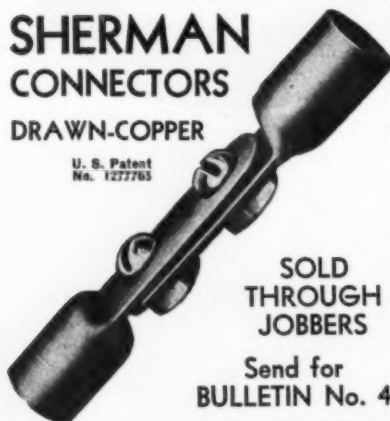
WALSER AUTOMATIC TIMER CO.
Chrysler Bldg. New York, N. Y.



SHERMAN CONNECTORS

DRAWN-COPPER

U. S. Patent
No. 1277705



SOLD
THROUGH
JOBBER

Send for
BULLETIN No. 4

SHERMAN SET SCREW CONNECTORS

AN OLD TYPE
WITH IMPROVED
FEATURES

Screws
Heavily
Rust-Proofed



Ask for
BULLETIN B

H.B. SHERMAN MFG. CO.
BATTLE CREEK MICHIGAN

and sprocket data for all pitches of chain. A section is also devoted to special chains with side lugs and extended pins for conveying systems and on chains of special materials, such as stainless steel, bronze, aluminum, Monel metal, etc.

Jefferson Electric Co., Bellwood, Ill., has just published an 8-page bulletin, 35-LT-2, describing its line of luminous tube sign transformers. In addition to illustrations of each item, the booklet contains complete dimension specifications and prices, together with information concerning the applications of the various types.

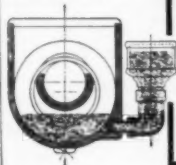
Bulletin GEA-1789 covering heat-resisting rubber compound, type R-359 and bulletin GEA-1790 covering moisture-resisting rubber compound, type R-348, have just been published by General Electric Co., Schenectady, N. Y.

A 4-page illustrated bulletin has been issued by Presto Electric Co., Inc., 32-34 West 20th St., New York City, manufacturers of high grade thermostatic flashers. Each unit is described in detail and is illustrated. Price-lists are also contained in the bulletin.

Bull Dog Electric Products Co., Detroit, Mich., announces the appointment of Paul Berry, 2528 N. W. 21st St., Oklahoma City, Okla., as Bull Dog representative to cover the states of Oklahoma, Arkansas, the city of Memphis and the northern section of Mississippi.



Write for our
Contractors'
Proposition
and trial plan



Increase Maintenance Profits by Cutting Maintenance Costs. SpeedWay Constant Level Oilers

Tests show that SpeedWay Oilers end 75% of motor troubles, that they cut oiling time to a fraction, prevent oil waste and dripping, pay for themselves quickly.

They will greatly increase your profit on maintenance work . . . will improve your service, lower your costs. Put a dozen on test with every customer.

SpeedWay Mfg. Co.
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BURNDY QIKLUG



*Installed
in a minute
with only a wrench*

BURNDY
ENGINEERING CO., INC.
305 EAST 45TH STREET, NEW YORK
Agents Everywhere

New easy way to
make **EXTRA
MONEY**



"We sold 15 elements the first week—we have installed Chromalox in nearly every stove in the city using open type elements," writes Corvill Electric Co., Linton, Ind.

GO AFTER REPLACEMENT RANGE UNIT ORDERS with Chromalox Units Clapp & Leach sold 54 units in 4 weeks. Altoona, Pa. dealer made \$136.50 in 2 months. Richmond, Va. contractor sold 48 units in 4 months, made \$187.20 profit. Chromalox replacement units are a money-making depression-proof item. Range owners want to buy them. Easy to install, sizes to fit every make of range, old or new. Write for sure-fire sales plan already in use by dealers; Liberal discounts; free sales helps, etc. No obligation.



You can do it, too!

MAIL WITH YOUR BUSINESS LETTERHEAD TODAY! E. L. Wiegand Co., 7585 Thomas Blvd., Pittsburgh, Pa. Without obligation, send us complete data about Chromalox Super-Speed Replacement Range Units and how we can make money selling them. There are approx. . . . elec. ranges in the territory we serve. Check which () We sell elec. ranges () We do not sell elec. ranges. () Send us catalogs about Chromalox-equipped electric ranges.

Signed Position



--- and
we've been doing it
since
1888

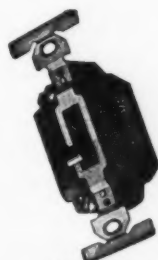
BRYANT has contributed to every activity that has been instituted toward the development of the electrical industry.

The industry has survived other "depressions"—and has weathered chaotic conditions that are written on the pages of industrial history. As a part of the electrical industry, The Bryant Electric Company is still very much in the picture and is stepping forward to greater achievements.

Electrical contractors have an important part to do. Upon them depends much in the recovery of prosperity.

In the electrical construction of homes, factories, public buildings, etc., build with the thought of permanence, quality and service. Order from your wholesaler wiring devices you **know** are the best.

BRYANT Superior Wiring Devices are priced to allow a satisfactory margin of profit to both wholesaler and contractor—and the line is complete. Not only is it complete in meeting today's demands, but tomorrow's also, as Bryant is constantly keeping abreast of time with the latest developments.



No. 4961



No. HF



No. 4832



No. 4322

The Bryant Line Includes

High Capacity Industrial Switches
Three-wire Polarized Plugs and Receptacles
Heavy Duty Range Outlet Receptacle and Fittings
Pilot Light Combinations
Hospital Signalling Devices
Complete line of Cord Sets

EC-10-33

BRYANT



SUPERIOR WIRING DEVICES

Manufactured by THE BRYANT ELECTRIC CO., BRIDGEPORT, CONN.

MANUFACTURERS OF "SUPERIOR WIRING DEVICES" SINCE 1888

MANUFACTURERS OF HEMCO PRODUCTS

NEW YORK
40 East 42nd Street

CHICAGO
844 West Adams Street

SAN FRANCISCO
149 New Montgomery Street

October New Products



Junction Boxes

Ralco Manufacturing Co., Chicago, Ill., announces the addition of XPH series junction boxes to its line of explosion proof products for hazardous locations. Boxes are made with integral union hubs. Type XPH-3 and XPH-4 can have all hubs fitted for $\frac{1}{2}$ in. conduit or any combination of $\frac{1}{2}$ in. or $\frac{3}{4}$ in. conduit size. The same conditions apply to type XPH-5 except center bottom hub which can be changed to take $\frac{3}{4}$ in. instead of 1 in. Outside dimensions of body are $3\frac{1}{2}$ in. long, $3\frac{1}{8}$ in. wide and $2\frac{3}{4}$ in. deep; cover opening $3\frac{1}{8}$ in.

Connector

The Conex universal connector which can be used on all common combinations of wiring is being manufactured by Weiss & Biheller, New York City. The con-



ector is made of bakelite with metal inside thread housed in perfect insulation. Cap inside of housing is coated with cadmium. Manufacturer claims connector can be easily, safely and quickly applied inasmuch as it requires no solder, tape or torch.

All-Rubber Lamp Cord

The Merchandise Department of General Electric Co., Schenectady, N. Y., has placed on the market an all-rubber lamp cord, designated as type SJ-PO, for table lamps, extensions, etc. The flexible, tinned copper conductors are insulated with 30 per cent rubber compound and outer jacket is of a high compound containing a high percentage of rubber. Conductors are readily identified by color of insulation. Cord is flexible and manufacturer claims it will not kink. Cord can be cleaned with a damp cloth. Standard colors are olive green, brown, black and ivory; other colors can be supplied on special order.

Combination Fan and Heater

Edwin L. Wiegand Co., 7585 Thomas Blvd., Pittsburgh, Pa., announces the Chromalox electric Heetflo (vertical type) which is a portable, motor driven combination fan and heater, equipped



with switch which operates either the fan or heater. Unit has shaded pole type motor; no radio interference; oilless bearings, and Chromalox enclosed type 1000 watt heating element. It is 9 in. high, $8\frac{1}{2}$ in. wide, and art-style bronze finish.

Industrial Tester

A portable a.c. testing set, known as the Industrial Analyzer, suitable for testing household appliances and industrial apparatus and motors up to 100 h.p., 440 volt, is announced by Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa. The unit is a miniature portable

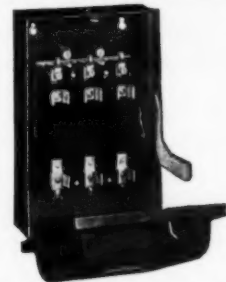


3-phase switchboard panel in a carrying case, complete with all necessary switching equipment, transformers and resistors, and contains a triple scale ammeter 0-5, 0-25 and 0-125 amp., a triple range voltmeter 0-150, 0-300 and 0-600 volts, a polyphase wattmeter with three scales for above voltage and current ranges; a polyphase power factor meter with 10-100-80 scale to operate on above voltages and currents. Instruments are of miniature type with standard size mechanism having high overload capacity and low energy consumption. Scales of instruments are $3\frac{1}{2}$ in. long. Two

lightweight current transformers with hipernik cores and with primary winding tapped for 5, 25 and 125 amp. are connected into circuit. Instrument is mounted in a carrying case 7x11x19 in. Case is provided with a leather carrying handle, trunk type hasps, lock and rubber cushioning foot.

Compact Switches

A line of compact switches, known as the 50,000 line, is announced by the Switch & Panel Division, Square D Co., Detroit, Mich. One of the major features of these switches is the smaller external dimensions with larger internal dimensions, permitting the entire area of



the back of the box to be used for wiring. This is accomplished by the elevation of the base from the back of the box by means of four mounting posts, allowing ample room for wires. The base is quickly and easily removable by loosening four screws. Operating handle is mounted on the side of the box independent of the balance of the operating mechanism. Dimensions of 3-pole, 60 amp., 575 volt model is $13\frac{1}{2}$ in. high, 8 in. wide and $5\frac{1}{2}$ in. deep.



Current Transformer

The Standard Transformer Co., Warren, Ohio, announces a multi-range portable current transformer which is contained in a molded bakelite case. Unit is 10VA capacity and is insulated for 10,000 volts. Transformer has wound primary covering a current range of 5/5, 10/5, 20/5, 50/5 and 100/5 amp. and is built so that inserted primary gives a maximum range of 800/5 amp. Approximate size of unit is $3x7\frac{1}{4}x9\frac{1}{4}$ and weighs approximately 9 $\frac{1}{2}$ lbs. Transformer is equipped with carrying strap.

Electrical Contracting, October, 1933

CONEX UNIVERSAL WIRE CONNECTOR

Now made in one size to take all common combinations

CONEX UNIVERSAL CONNECTORS



MADE IN U.S.A.
Patent No. 1578752
Patent No. 1700985
This bakelite connector has the corrosion—and rust-proof cadmium-coated metal thread assuring perfect insulation.



If you want to make an easy, quick and safe connection without tape, solder or torch, try

CONEX UNIVERSAL

They are approved by the underwriters.

Your local wholesaler has them, or write direct to

WEISS & BHELLER, Inc.

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NEW YORK CITY

MINERALLAC PRODUCTS



HANGERS FOR CABLES & CONDUITS

Easily the best for quick, low-cost installation work. Send for full details and costs.

1 Hanger without Porcelain Bushing. Spring steel; stronger, quicker, more compactly arranged.

2 Hanger attached to steel beam with bolt and nut.

3 Jiffy Clip—quicker, neater work at less cost.

4 Cable Joint or Pot-head Compound—3 grades for every system, underground or overhead.



JIFFY CLIPS



Insulating Compounds

MINERALLAC ELECTRIC CO.

25 North Peoria Street, Chicago, Ill.

R C A Victor Company, Camden, N. J., has published a 4-page booklet describing the R C A Victor portable sound amplifier, model PG-63. In addition to a condensed description of the unit, the booklet is illustrated and also contains a list of places where this amplifier may be used.

Killark Electric Mfg. Co., St. Louis, Mo., has published a catalog on explosion resisting conduit fittings for Class 1, Group D locations. The catalog is fully illustrated and contains installation diagrams as well as list prices.

Bulletin No. 54 published by Reynolds Electric Co., Chicago, Ill., describes their complete line of thermal flashing units. In addition to illustrations of each unit, price-lists are also contained in this bulletin.

Catalog No. 15 illustrating and describing the complete line of electric signaling and protective devices manufactured by the Auth Electrical Specialty Co. Inc., of New York City, has just been issued by the company.

Classified Advertising

Position Wanted: Construction manager and estimator with 18 years' technical and practical experience in electrical construction of schools, hospitals, office buildings, factories, Post Offices and residences. Will consider foremanship or electrical maintenance. Age 37. Go anywhere. Box 1033, Electrical Contracting, 520 No. Michigan Ave., Chicago.

Position Wanted: Bookkeeper with experience in the electrical field, well educated, and capable of assuming responsibility of office, including correspondence, collections, credits, financial statements and detailed work. Quick and accurate. Will accept moderate salary. Box 133, Electrical Contracting, 330 West 42nd St., New York.

SPECIFY "Latrobe"

FLOOR BOXES—ACCESSORIES
"BULL DOG" INSULATOR SUPPORTS
"KEYSTONE" FISHWIRE
CONDUIT BENDERS

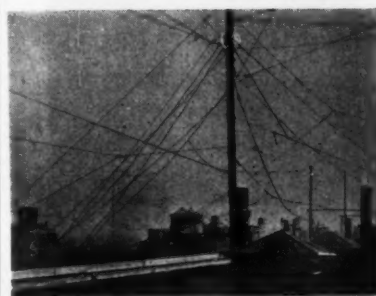
All manufactured by Fullman Mfg. Co. and carried in stock by over 300 jobbers—Send for Catalog No. 225.
FULLMAN MFG. CO. - LATROBE, PA.

One perfect ANTENNA

With the RCA Victor
Antenaplex System

FOR THE ENTIRE
BUILDING

or this MAZE



Progressive owners and managers of large and small buildings alike know the advantages of clear and efficient radio reception for their tenants.

THE RCA VICTOR ANTENAPLEX
SYSTEM SOLVES THE PROBLEM
FOR THE MULTI-FAMILY
DWELLING

This new field offers unusual opportunities for the progressive electrical contractor—as simple and inexpensive to install as an annunciator system—as important in the modern building as the telephone system. Investigate the possibilities of this up-to-the-minute improvement.

It means profits for both the contractor and the owner—with everlasting satisfaction for the occupants.

Send for loose leaf booklet
in convenient pocket size binder—
it contains a wealth of information



Centralized Sound Section

RCA VICTOR CO., Inc.

CAMDEN, N. J.

"Radio Headquarters"

WHY G-E TIME SWITCHES?



BECAUSE every detail of the T-13 has been engineered toward producing a time switch that will operate year after year without trouble, maintenance, or inspection. It combines the widely known Telechron motor and the mercury-to-mercury contact Kon-nec-tor—the switch that never wears out in service. Thousands of installations are proving the extraordinary dependability of the T-13. It is accurate, reliable, simple, economical, widely adaptable, and requires no oiling or winding—yet, with all this, moderately priced.



621-30

GENERAL ELECTRIC

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N. Y., Room 307, Bldg. No. 6.

Name.....

Firm.....

Address..... EC-10

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**NOW—this
ELECTRIC MOTOR
REPAIR LIBRARY
tells how to handle all kinds
of profitable repair and re-
winding jobs**

Do you know how to:

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- test a.c. and d.c. motors to locate grounds, shorts, opens, quickly and positively
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- wind stators for turbogenerators
- band high-speed armatures
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- etc., etc., etc.

1,079 pages of practical shop methods and data on jobs like these in this library. A complete, up-to-date key to repair of all motors. Nothing else in it; every page filled with definite, practical facts for the industrial maintenance man and the electric shop worker.

**4 volumes, \$10.00, payable in
easy monthly installments**

THIS set of books should be on the shelf of every man who ever has to touch a motor for purposes of repairing it or changing it to meet different operating conditions. In shop language and with practical shop methods it covers every step in stripping, rewinding and connecting a.c. and d.c. motors of all kinds.

How to change motors for different operating conditions

Here is all the information you need in order to determine what changes various types of motors permit; to lay out new windings for specified service conditions; and to handle every step in the work with satisfactory results.

Covers all types of motors, from those used in small household and commercial appliances of all kinds, to mining and railway motors. Explains principles underlying the different types of windings; gives definite instructions for doing the various rewinding jobs. Also gives many data, tables and diagrams constantly needed by the repair man, including data difficult to get from any other sources.

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Send Electric Motor Repair Library for 10 days' examination on approval. In 10 days I will send \$2.00, plus few cents postage, and \$2.00 monthly for four months, or return books postpaid. (We pay postage on orders accompanied by remittance of first installment.)

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Company..... EC-10-33
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TO MEET THIS *NEW* CLAUSE IN THE 1933 NATIONAL ELECTRICAL CODE

602-d. Single conductor Type R wires, unless provided with a lead sheath, shall be covered for their entire length with a braid which is both flame-retarding and moisture-resisting.



insist upon

U. S. SAFECOTE WIRE

1,635,829
1,772,436
1,765,000



1,798,486
1,410,790
1,536,549

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MADE BY THE WORLD'S LARGEST PRODUCER OF RUBBER

Manufactured under license by

United States Rubber Company

1790 BROADWAY  NEW YORK CITY

Stocks in all Industrial Centers



THE SUCCESSFUL CONTRACTOR

In planning for the future Contractors cannot place too much dependence upon increased volume—this is no time to base profits on hoped-for volume. Consistent profits on the volume of business now obtainable is something every Contractor and Dealer must reckon with.

A FORGOTTEN FUNDAMENTAL

It's human to strive for more business, but those who have come safely through the years have learned that the true measure of success is not size but progress—progress not necessarily in volume but in PROFITS.

STEER A SAFE COURSE

These are days of constantly changing costs, every guess on prices is a bad guess—a probable source of loss. Why not profit from the experience of hundreds of successful Contractors and Dealers who have depended upon the NATIONAL RESALE PRICE SERVICE for years as their pilot to steer them to Surer Profits.

Don't dismiss the profit possibilities of this unusual Service until you have investigated. The coupon below attached to your letterhead will bring you the details.

Henderson-Hazel Corporation,
5005 Euclid Avenue,
Cleveland, Ohio.
Gentlemen:

Without obligation please send us your booklet describing the NATIONAL RESALE PRICE SERVICE.

Name _____
Address _____
City _____ State _____

EC-10-33

better quality
MAKES



PLYMOUTH
THE WHOLESALERS
best SALESMAN

Who ever heard of real live rubber drying out? It won't! The fabric in Plymouth Tape is so thoroughly impregnated with pure live rubber that it cannot or will not dry out.

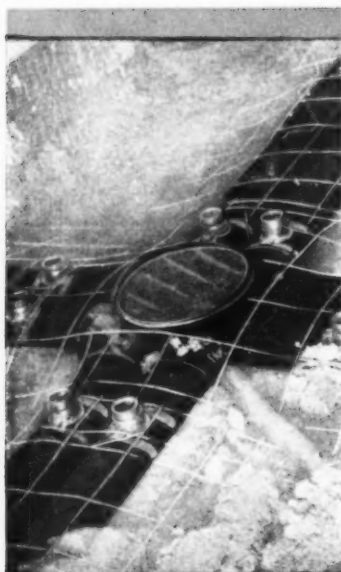
Neither will Plymouth Tapes pull away or leave bare spots. They contain a real adhesive capable of withstanding all ranges of temperature. It is that power to adhere for an indefinite length of time that distinguishes Plymouth from tapes that just appear to be sticky.

Wholesalers pronounce Plymouth Tapes their best salesman because those contractors who are quick to recognize the advantage in Plymouth quality are quick to place orders for Plymouth Tapes.



Manufacturers
Since 1896

PLYMOUTH RUBBER COMPANY, Inc.
CANTON, MASSACHUSETTS



Wiring Flexibility with G-E FIBERDUCT

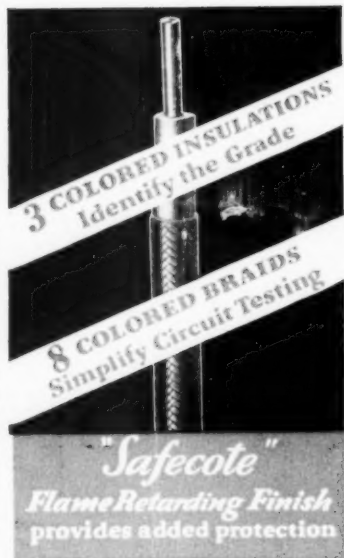
Planning for tomorrow's electrical needs is the problem of today. A G-E Fiberduct Underfloor Wiring System provides not only enough outlets for present requirements, but also makes it easy to install additional outlets. Discontinued outlets can be neatly capped until needed again.

This underfloor duct provides a flexible wiring system which enhances the value of property. It is economical to install.

Any G-E Merchandise Distributor will gladly furnish you with complete information, or send for booklet to Section CWF-2010, Merchandise Department, General Electric Company, Bridgeport, Connecticut.



**GENERAL
ELECTRIC**
FIBERDUCT



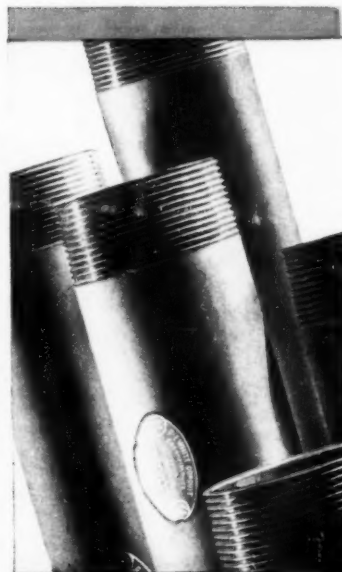
For Quality Jobs We Say G-E CODE WIRES

It's easy to work with General Electric Code Wire because the guess work has been eliminated. These high-quality wires have self-identifying braids in 8 colors which facilitate circuit testing. 3 colored insulations identify the grade. (Black, Red and Green identify Code, Intermediate and 30%.) These advantages plus flame-retarding finish, contribute to outstanding wire values for quality construction. Use these materials by all means.

A G-E Merchandise Distributor, located in your territory will give you full information, or write Section CWF-2010, Merchandise Department, General Electric Company, Bridgeport, Connecticut.



**GENERAL
ELECTRIC**
CODE WIRES



PERMANENT PROTECTION for Wiring Systems

G-E White Rigid Conduit is built to protect wiring systems permanently. It eliminates the penetration of water, oils, acids and alkalis. Hot-dip galvanizing (inside and out) and a super coating of glyptal (inside and out) resist rust and corrosion.

G-E Conduit is made of alloy steel which bends with minimum effort. It has sharp, clean-cut threads which make chasing or re-threading unnecessary. Easy wire pulling is a feature.

See your nearest G-E Merchandise Distributor for further information, or write Section CWF-2010, Merchandise Department, General Electric Company, Bridgeport, Connecticut.



**GENERAL
ELECTRIC**
RIGID CONDUIT

MERCHANDISE DEPARTMENT, GENERAL ELECTRIC COMPANY, BRIDGEPORT, CONNECTICUT

